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THE INFECTIOUS DISEASES AS A FIELD OF INVESTIGATION IN PATHOLOGY *

FREDERICK P. GAY, M.D.
BERKELEY, CALIF.

When we consider that the science of pathology is seventy years old and that its object and scope were stated in its inception as fully and accurately as the most modern of us today could desire, it seems strange that a restatement of its essential purpose should be periodically required. There is at least one assertion that all of us concerned directly or indirectly with the study of disease are prepared to admit; pathology as a separate science was born with Virchow, and its birth was signalized by the publication in 1847 of the famous *Archives* of Virchow and Reinhardt.

The significance of the title of this publication has not perhaps always been appreciated. "The archives for pathologic anatomy and physiology and for clinical medicine," it runs. Virchow's introductory article in the first number, "Ueber die Standpunkte in der wissenschaftlichen Medizin," is today as pertinent and as explanatory of the purpose of our science as when it was written. Its reperusal is particularly to be recommended to those who think that in clinging to the purely morphologic type of pathology they are carrying out the ideals of our illustrious predecessor.

Virchow's conception of the scope and possibilities of pathology was far broader than present-day standpatters would have us believe. His vision was far from restricted to the microscopic field that encircles some obvious structural change that may or may not bring to our minds some conception of the functional disorder that has preceded. Virchow's editorial introduction, to which I have referred, is notable in several particulars. In the first place it states clearly the duty and privilege of pathology in respect to clinical medicine, namely, that it serves as an intermediary between the more fundamental sciences and practice. These fundamental sciences are justifiably self-sufficient and introspective; they determine certain utilizable facts, but bear no direct message to the practitioner. It remains for pathology to apply these facts toward the understanding, the diagnosis and the treatment of disease. It is interesting to find that Virchow lays principal emphasis on the development of pathologic physiology as the greatest aid to the healing art; in no uncertain terms he states that the prime object of pathology is the study of disordered function.

You may ask how we can reconcile this creed with the master's own performance, with his own personification as a father of cellular pathology. There is nothing simpler. Virchow was a great scientist not simply because through assiduity and keen perception he established a great point of view, solved a major problem, but because he recognized a problem which at this particular epoch was capable of solution. In 1850 the stage was set for the working out of the structural alterations in disease. Anatomy and histology had progressed so that the recognition of cell types and cell structure was possible. The methods of physiology and biochemistry were not, however, as yet utilizable for the study of disordered function. The science of bacteriology, destined to throw the greatest light on both the cause and the evolution of disease processes, was as yet unknown. It was obvious, then, that Virchow, although keenly aware that the logical goal of pathology is the study of disordered function, should have devoted his own lifetime to the more accessible study of altered structure.

An overemphasis for sixty years on the residual aspects of disease has not been without effect on the philosophy and mode of thought of the pathologist himself. A consideration of fixing fluids, of methods of embedding, of the action of dyestuffs on coagulated proteins, the purely observational and statistical attitude inherent in collectors of chance and uncontrollable material, have produced an essentially static point of view of disease. The confirmed morphologist is suspicious of anything in the making, he is bewildered by anything that may represent the essentially dynamic conditions of the living body.

If the object of pathology is to aid preventive and healing medicine, we must understand the causation and the course of disease rather than its results — must be interested in the forces engaged and the battle itself, rather than the appearance of the battlefield after the fight is lost.

The delayed development of experimental pathology is to some extent due to the arresting tendency of overemphasis on structure, but largely to the necessarily delayed development of methods of attack on problems of this sort. It is natural, however, that some investigators could not remain simple collectors of necropsy material, satisfied with deductions and retro-active judgment between demonstrable effect and presumable cause. Purely statistical methods of investigation must in more alert minds yield to comparative studies. Simple deductions from observed phenomena must be followed by inductive experimentation. To those who look for the explanation of disease in the

* Chairman's address, read before the Section on Pathology and Physiology at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

resultant lesion, successful experimentation means the reproduction of similar lesions rather than the reproductions of such conditions as give rise to them. Chronic nephritis, retraction of the heart valves, arteriosclerosis, embolism, infarction, are all lesions, the experimental production of which has interested pathologists since Cohnheim. How little explanation such studies have yielded as to the causes underlying the original diseases as they occur; how little they have aided in their prevention and cure! It is true that the grosser mechanical methods of Cohnheim, such as instrumental destruction of the heart valves to produce insufficiency, and the injection of poppy seeds into the circulation to produce emboli and infarction, have given way to more refined methods of experimentation. A choice of chemicals may determine a lesion of the kidney confined to the glomerulus or the tubules, and careful study of coincident metabolism may parallel human nephritis. And yet the method of attack is still as blundering and empiric as ever, and mere striving for a closer similarity of lesion will never explain to what conditions the original disease is due. We have tried in vain to reason back from effect to cause; the tail has tried too long to wag the dog. It would seem as if the successful results obtained in the study of the acute infections should have led more morphologists to be born anew, to strive to experiment and reason from the beginning toward the end in spite of their predilection for the reverse process.

The successful experimental study of the infectious diseases has been possible through the determination of specific causative agents. The separation of the animate inciting factor of a given infection renders the study of that disease not only relatively simple but also logical, in that one proceeds from cause through progress to result produced. A lesion, when it occurs, assumes its proper terminal and subsidiary position. Many infections, indeed, though violent or even fatal, are not signalized by striking morphologic changes in the fixed tissues; and even in those cases in which profound structural changes ensue, they are at best no certain index of the conflict that has taken place in the body. The lesions of Peyer's patches and endothelial proliferation give little suggestion of typhoid fever as primarily a septicemia; the degree of the involvement of the lungs in pneumonia bears little relation to the outcome.

It is curious how the peculiarly fixed habit of thought of the morphologist renders him uninterested, inexpert and skeptical of experimental data, even when they are so peculiarly sequential and complete, as in bacterial infections. A leading histopathologist has recently prefaced his textbook with the statement that experimentation leads only to confusion. Such confusion, of course, is dependent on the type of mind of the would-be experimenter. Static pathologists of this type unfortunately still dominate our science. "Pathology" is still used to mean morbid anatomy rather than the natural history of disease. Would-be experimentalists have, at best, not been encouraged to relegate tumor diagnosis and necropsies to their proper place as routine. The clinicians, of course, prefer that type of pathology with which they are familiar, and pretend to regard it purely as ancillary to the medical art. Pathology is no handmaiden but an inspiring goddess, showing the way to more scientific methods of diagnosis and cure, instead of simply confirming or gently disagreeing with bedside opinion.

When of late years some of the younger pathologists have turned to experimental fields, they have naturally chosen those diseases which have been impressed on their minds during their morphologic training; they have investigated the chronic or the metabolic diseases. It is now possible to attack these problems with the aid of chemical and physiologic methods. I do not wish in any way to minimize the value of the laudable attempts that are being made, although these problems do not appeal to me as the timely ones. Their solution would seem to wait on the discovery of essentially new methods of attack rather than the simple applications of methods of use in the fundamental sciences, as is the present tendency.

I believe the experimental study of the infectious diseases is still, in spite of thirty years of increasingly successful endeavor, the greater field of promise for the investigating pathologist. Let me consider briefly the relative importance of the infectious diseases, and my reasons for belief in the timeliness of the problems they present.

I was led a few years ago to estimate certain numerical relations between infectious and noninfectious diseases, since no collected data were to be found for my purpose. A careful summary of the disease entities treated in Osler and McCrae's "System of Medicine" (first edition) from the standpoint of etiology was first made. Decision as to what constitutes a disease entity and what are simply varying manifestations of a given disease is in the nature of things somewhat arbitrary. And again it is difficult to estimate in some instances whether the evidence for a parasitic cause is as yet fully acceptable. In spite of these causes of error the findings are judged worthy of presentation. Three hundred and sixty-nine separate disease entities was the total obtained; and 144 of these (39 per cent.) were recognized to be due to infectious agents alone; another thirty are at least in part infectious in origin, and fourteen more are probably of similar nature. The total of the infectious diseases is 52 per cent. In a similar way and on the basis of the first classification, 40 per cent. of all the deaths in California in the year 1911 were directly or indirectly of infectious cause. Any subconscious prejudice which may have affected the gathering of these data is probably more than balanced by the truth that will eventually be learned concerning the causation of certain diseases that are here included under other headings. At least we may assume that the infections form a large and probably the predominating group of human maladies.

The infectious diseases, apart from their numerical and actual importance, afford today the problems of greatest interest and promise in medicine. In spite of the relatively great emphasis that has been laid on these diseases in the last twenty years, many questions of etiology, and still more of specific diagnosis, prevention and therapy, remain to be solved. Further concentration on these problems is recommended because, even with the methods so far developed, most tangible and practical results have been obtained. We may look forward confidently to the eventual clearing up within a finite period of the etiology in diseases of which the parasitic nature is at present only suspected. We may expect to develop more or less perfect specific methods for the diagnosis and evidence of protection against these diseases, and may anticipate relatively certain means for their prevention and cure. Every effective blow delivered against the infectious

diseases will in turn diminish such chronic diseases as nephritis, endocarditis and arteriosclerosis, the initial infectious nature of which is in many instances recognized.

The study of the infectious diseases will, at least for the present, continue more timely and profitable than similar effort expended on metabolic or chronic diseases, owing to certain qualities inherent in their causation and the methods of investigations involved.

The parasitic disease is due to a single cause with predisposing factors of minor importance, whereas the other diseases are probably due to the operation of a number of causes or predisposing factors. The single parasitic cause is not only separable from the body of the host, but also capable of reproducing the disease under a relatively wide range of conditions, and frequently in a number of different animals. Apart from the handiness of a single separable factor, the study of an experimentally reproduced disease from its real beginning is probably of greater logical advantage than has been generally appreciated. The type of pathology which follows forward rather than looks backward has already been sufficiently emphasized. The methods of experimentation that have grown up in connection with bacteriology and immunology are successful in part because they are distinctive and original in development, and do not consist primarily in adaptations of the methods of other sciences.

And lastly, the study of the infectious diseases has yielded the greatest practical results to clinical medicine, owing to the facts that not only is their cause specific, but also, in each instance the body of the host is likewise stimulated to a characteristic response. On this specific reaction of the animal body to an infecting agent depends the striking diagnostic tests and all vaccine and serum therapy.

GRIP IN CHILDREN *

LAWRENCE T. ROYSTER, M.D.
NORFOLK, VA.

The syndrome commonly called grip is endemic throughout the entire cold weather months of the year, its curve presenting waves of greater or less severity during the course of a single season. The annual curve presents periodical elevations a number of years apart, the number of cases in certain years being so large as to reach the proportion of an epidemic, at which time there is also a marked increase in the severity of the disease. Such prominence as this was acquired during the past winter (1915-1916). There can be no doubt that grip is a general infection, presenting systemic manifestations of greater or less severity. I do not know whether or not all the conditions I shall describe are due to the *Bacillus influenzae*, but I have so classed them because they have appeared in the course of a general epidemic of grip, and are apparently of the same infectious origin.

Common Type.—The prevailing type during the past season was that most commonly encountered. It was characterized by a sudden onset with prostration of greater or less severity, and a rise in temperature lasting from two to five days. The height of the temperature varied widely, from one to two degrees' elevation to a temperature of 105 or 106. Generally speaking, in those cases in which the temperature became suddenly and extremely high, but of short duration, the prostration was most marked. This type of the disease was frequently difficult to distinguish from pneumonia. The physical signs of pneumonia were not present, but this is of course frequently the case in the early stages of pneumonia itself, and the pulse-respiration ratio was not interfered with. When the temperature was of longer duration (from three to six days), even if moderately high, the prostration was usually less marked.

Older children were subject to pain in various regions, such as the head, arms, legs and abdomen. These pains were sharp and violent or boring in character. In infants high temperature and severe prostration were the chief symptoms. A considerable number of these patients had short attacks and speedy convalescence; frequently, however, the convalescence was long drawn out, the patient regaining strength slowly, while death occasionally followed after two days' illness. A marked feature in these cases was an irregularity of the heart's action.

Catarrhal Type.—The main difference between this and the type just described is that bronchitis and coryza were prominent symptoms. The lacrimation and coryza and the injection of the eyes were so severe as to remind one of measles. The bronchitis was so severe that it closely resembled the capillary bronchitis of older writers. This bronchitis was generally of short duration, but it was naturally in this type that pneumonia was the most frequent sequel. The type of pneumonia of course varied, but in spite of the generalized bronchitis, the lobar type of pneumonia predominated, the cases of bronchopneumonia having been comparatively few. Naturally, the greatest mortality came from this complication.

Gastric Type.—In many instances vomiting was so violent and persistent at the onset that the term "gastric type" seems justifiable. This vomiting was so severe at times that the patient appeared sometimes to be in danger of dying from exhaustion. So prevalent was this type that a number of physicians thought they were dealing with cases of cyclic vomiting. I do not think they should have been confused because the vomiting was of shorter duration than usually occurs in cyclic vomiting; also, some of these cases occurred in children who were accustomed to have recurrent vomiting, and even they realized the difference between the nature of the attacks.

The evidence of diacetic acid in the urine, which usually appears before the onset of vomiting, in these cases was entirely absent at this time.

Diarrhea.—This is frequently described as a complication or sequel of grip, and, in fact, in children it is an accompaniment of almost any condition, but the number of cases of diarrhea complicating this epidemic was an entirely new experience to me. These cases differed in no way from the infectious diarrhea so common in summer. The stools passed through the usual stage of fecal, mucous, pus and blood. I regret that I did not have an opportunity to study their bacteriology. This diarrhea came on immediately after an attack of high temperature and prostration, and did not follow the catarrhal type in a single instance. Its duration was one week.

Convalescence.—This was variable. In some of the most severe cases, the patient convalesced with remarkable rapidity, while some of those cases which appeared mild were long drawn out, the patient remain-

* Read before the Section on Diseases of Children at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

ing quite weak for a long time. The convalescence I refer to is that in cases without complications; complications, of course, made convalescence tedious.

Exacerbations.—Among the most usual complications and sequelae may be mentioned exacerbations. In a number of instances there was noted an exacerbation or reinfection, I do not know which. These were sometimes as much as two weeks apart, and as far as severity is concerned, they bore no relation to each other. In many instances two such recurrences were observed.

Pulse.—I have noted several cases of irregular pulse. Some of these were simple arrhythmia, while others were of varying degrees of weakness. This may have been merely toxic, but I have suspected that there was really a myocardial involvement.

Otitis Media.—This was most frequently observed in those cases in which catarrhal symptoms predominated.

Pyelitis.—This has been quite common as a sequel. I am not prepared to explain this, unless there was a low-grade infection existing previously, not sufficiently severe to cause attention to be attracted to it, but brought out by the lowered resistance of the patient. The infection was due to the colon bacillus.

Pneumonia.—This has already been mentioned as a complication, but during the past year there were noted several cases of what has been described by several authors as recurrent pneumonia, that is, several attacks of apparent lobar pneumonia, with perhaps as much as a week intervening between attacks.

Cough.—One of the most troublesome sequelae was persistent cough. This might follow a simple bronchitis or a pneumonia. This cough was at times harsh and distressing and its persistence exceedingly discouraging. At times it was indistinguishable from whooping cough. The exact nature of this complication was sometimes difficult to explain. In a number of cases, however, I was able to elicit D'Espine's sign, and this condition led me to the conclusion that it might be due to enlarged peribronchial glands.

Prolonged Temperature. — Another troublesome sequel was prolonged fever, ranging from normal to 100 or more and persisting apparently indefinitely. Some of these cases gave no evidence of a rise of temperature unless the thermometer was used, while in other instances the child became drowsy and cross with the rise of temperature. The cause of this prolonged rise in temperature was as difficult to find as was that of the cough, but, as in the case of cough, I was frequently able to elicit D'Espine's sign. This brings me to the same conclusion, that the rise in temperature was quite frequently caused by enlarged peribronchial glands.

Von Pirquet Reaction.—In cases of cough and rise in temperature, as just described, I have not infrequently secured a positive von Pirquet reaction. This may be a coincidence, the reaction not having been tried before, and possibly would have been positive previously, but I think from my histories in cases of tuberculosis that grip ranks second only to measles and whooping cough as an antecedent of tuberculosis.

Meningitis.—Pure influenza meningitis is a clinical entity, though rare; I have never seen a case, but I think pneumonia meningitis following grip is slightly more common than after primary pneumonia.

Skin Eruptions.—During this epidemic there was a number of skin manifestations, such as simple erythema, scarlatiniform, morbilliform, urticaria and sudamina.

A point well worth emphasis is that nursing infants are by no means immune from grip.

TREATMENT

I shall outline treatment very briefly. By far the most important part of treatment is prophylaxis. This is particularly important in young infants, since the mortality among them is very high; therefore, when any member of the family has grip, or even a bad cold, which may be a mild grip, he should be kept away from the younger members of the family. In the case of breast-fed infants the mother who has grip should be instructed to keep her nose and mouth tied up with a handkerchief while nursing or when caring for the infant. This is equally important in the case of any attendant who is compelled to go very near the infant. Large crowds or places of general gathering should be avoided. On the other hand, children should be kept in the open air as much as possible, except in dry windy weather, the dust under such conditions tending to spread the contagion, or at least to irritate the nasal passages to such an extent as to make them susceptible.

In the usual type my main reliance has been on sodium salicylate. I think that my best results have been with this drug, and I still prefer the natural to the synthetic product. Occasionally the aching is so severe as to require opium. An initial dose of Dover's powder is desirable, and of course a purgative should be administered. Regardless of how mild the attack may be, the patient should be confined to bed.

In the catarrhal type I use nose drops of menthol and camphor in liquid petrolatum. This is not only antiseptic, but makes the patient decidedly more comfortable, and I am quite certain it tends to prevent middle ear infections.

The bronchitis is treated as any other bronchitis. In the tight stages wine of ipecac may be given to promote an outflow of mucus, and after this has been accomplished, ammonium chlorid may be used advantageously. At times the cough is so severe as to require opium, which should not be withheld if there is constant racking, since the strain on the heart is too great. The general principles of pneumonia treatment are used.

The gastric type presents difficulties, since the child can take nothing while it is vomiting. Keeping the infant absolutely quiet is about all that can be done until the vomiting ceases. In these cases the bowels must be moved by means of enemas.

The cases of diarrhea are treated as its analogue, summer diarrhea. An initial colon flushing, carbohydrate diet and small doses of salines have been most satisfactory in my hands.

The irregularity of the heart calls for absolute rest until all arrhythmia has ceased. This may suffice, but in some instances digitalis must be administered.

Otitis calls for the usual treatment. Personally, I favor early incision of the membrana tympani in cases of otitis rather than waiting for the bulging of the membrane.

The cases of persistent cough are exceedingly troublesome. Fresh air, tonics, such as cod liver oil, and systematic rest in the recumbent position are most beneficial. Occasionally, the severity of the attack calls for opium. Unfortunately, many of these cases persist until the advent of warm weather. The same may be said of prolonged fever.

Grip should be a quarantinable disease. Especially is this true of schools, from which teachers and pupils afflicted with grip or "colds" should be excluded.

ABSTRACT OF DISCUSSION

DR. ISAAC A. ABT, Chicago: If one asks, What is the etiology of grip; what have the studies of grip shown? he finds there is a great deal of confusion. Bacteriologists find every organism. It makes us think that the grip infection is very elusive and difficult to find, or else the bacteriologists have not solved the question. The seasonal occurrence is another thing. Why does it begin to disappear when the sun appears, being practically absent during summer and early fall. They tell us that even in California and Florida grip epidemics occur during the winter, so that it is apparent that so-called grip is a disease of the winter time. We are apt to overdo the matter of sending children out of doors in all kinds of weather. I know babies who are taken out doors when I would not drive my horse out of doors. Babies are frequently taken out and allowed to remain an excessively long time until they are chilled and uncomfortable. We fear the effects of heat but absolve excessive cold from all harm to the baby. Extremes of either heat or cold probably lower the little baby's resistance. I have known babies convalescing from grip and progressing favorably when kept indoors, and when taken out and exposed to the cold and wind have come back with severe exacerbations. The seasonal occurrence indicates that the weather conditions in some way or other bear casual relation to the grip. Very often, I think, vomiting is not an expression of gastro-intestinal infection but of general toxemia. In case after case the first thing noted is that the baby vomits incessantly, and in those babies who are subject to cyclic vomiting it seems to me the vomiting is brought on by this so-called grip infection. These babies, in addition, often have an acute swelling of the adenoid tissue in the nasopharynx, and manifestation of acute inflammatory conditions in the tonsils. These conditions very soon lead to complications in the middle ear. As to the cough, I quite agree with Dr. Royster that this is sometimes out of proportion to the rough breathing. I think it is often due to pharyngitis, and often to infection of the mediastinal or bronchial glands. A roentgenogram made of these chests will show enlarged bronchial glands. When there is no von Pirquet reaction and no other reaction to tuberculin it may be assumed that the cough is probably due to grip infection of the mediastinal glands. In relation to pyelitis, this seems to occur frequently following grip. It seems to me there is more nephritis produced by excessive use of hexamethylenamin than we commonly think, and many cases of acute hemorrhagic nephritis are not so much due to the organisms and toxins of grip as to this drug.

DR. J. P. SEDGWICK, Minneapolis: I was very much interested in what Dr. Abt said in regard to vomiting. Several years ago I called attention to the relation of infection of the upper respiratory tract to a certain type of recurrent vomiting. Sometimes these cases are relieved by treatment of the respiratory tract. Dr. Smith afterward independently found this same condition. I am sure there is a connection between them. This winter we have been following this grip epidemic very closely, and I believe by following these cases with a flouroscope and plates we will get a great deal of instruction. I know we have been greatly instructed and have found some of our older ideas incorrect. As to treatment, in some of these cases in which nasal obstruction in younger children is pronounced, the careful use of epinephrin is very beneficial.

DR. FRANK S. CHURCHILL, Chicago: We should be more careful in our description of these cases. We have all been treating them this winter. We had an epidemic of what looked like grip in Chicago, but in most cases—practically all of my own and most of those of others—the bacillus of influenza was not found in the nasal or pharyngeal secretions, but a form of streptococcus was present. If we are to adhere strictly to the use of the term "grip" for infections with the bacillus of influenza then these cases were not "grip." They acted like grip, but in reality they were not. I would like to ask Dr. Royster if in his respiratory cases the bacillus of influenza was found.

DR. G. H. FELLMAN, Milwaukee, Wis.: During the month of December we had 150 cases of this so-called grip at the Milwaukee County Dependent Home for Children. At that time the days were cold and the roads very dusty, as very little snow had fallen. Examination of smears from the throat and nose showed the presence of a small diplococcus, streptococci and a very few Weeks' bacilli. Pneumonia developed in about 10 per cent. of the cases. It was of a mild type, running its course in from three to ten days.

DR. HARRY LOWENBURG, Philadelphia: I would like to ask Dr. Royster if he found leukocytosis present. It occurred in all of my cases.

DR. JOSEPH BRENNEMAN, Chicago: There is a difference between "grip" and "grippe." I think grip is a very useful word to designate these periodic epidemics, while "grippe" is synonymous with influenza. It is very interesting when we observe such an epidemic as we had in the last winter to find that in North Carolina and New York they have had the same epidemic. It must be the same organism. Of the symptoms, I would say we found almost the same as described by Dr. Royster, except that two stood out conspicuously. One was abdominal pain. If a mother said her child had stomach ache, I would look in the throat. If I could not determine a definite infection there I would look in the ears and I would often find an otitis. That would tell me that the child had had a throat infection previously. I know of at least three patients operated on for appendicitis in which the appendices were found perfectly normal. One of those cases showed enormously enlarged mesenteric glands, suggesting the possibility of glandular infection. In two other cases there were hemorrhages into the intestinal walls. In one most interesting case that I saw with Dr. Krost, the child had a sore throat, very much swollen, with spots, then a hemorrhagic urticaria, and then a very decided abdominal colic with a palpable lump in the abdomen, and the abdomen was much distended. In other words, the child began with sore throat, and then had all the other symptoms of a typical Henoch's purpura, with final recovery. I think there is no question that the child had in its intestinal wall a hemorrhage. The tendency to hemorrhage was very common in these cases. I saw one patient who had an inflamed throat, then a hemorrhage on the eyelid, and in the hand, then an exsanguinating hemorrhage from the bowels, and afterward the urine for two months looked like pure blood. This hemorrhagic nephritis lasted for over two months and then cleared up. I would estimate that over 30 per cent. of our cases had abdominal pain as a decided symptom; that was helpful in diagnosis. Another thing is the relation of these cases to certain exanthems. In the same hospital ward I have seen a child with sore throat, another with an indefinite eruption, and then another with typical scarlet fever. It has been a very unhappy winter for us, especially in hospital work, because in many cases it was impossible to tell whether certain cases were scarlet fever or not. The mortality of less than one out of three or four hundred cases as reported by the health department made us think it was not scarlet fever that we had to deal with in most of these cases, but the type of infection described by Dr. Royster, with a scarlatiniform eruption. One almost wondered whether the early typical "grips," the late "grips" with indefinite rashes, and later in the season, the many very mild scarlets, were not all the same, bacteriologically.

DR. V. W. TURNER, Des Moines, Iowa: The treatment we usually used was salicylates, but we found a large percentage get well without treatment.

DR. J. I. DURAND, Seattle: We had the same epidemic in Seattle. It is a clear-cut clinical entity, and the name grip is as good as any for the condition. There is one point I want to make, and that is in regard to infection. I think it is purely a respiratory infection and contaminated air must be inhaled to produce the disease. Every child in the ward of a hospital, or every member of a family will generally become infected, and yet I have seen children with cases within three feet on each side of them without infection, merely by putting a double wall of gauze between the beds and

absolutely preventing drafts which might sweep the organism from one bed to the other. The same nurses, without any special precaution as to changing gowns, took care of all the children.

Dr. Eleanora S. Everhard, Dayton, Ohio: We had much the same kind of an epidemic in Dayton. As to treatment, following the theory that the body cells as soon as they become excessively acid swell up and cause congestions, many of us treated our patients with large doses of alkalies. In children the vomiting very promptly subsided with potassium citrate. They could take that when they could take nothing else. We got much better results with potassium citrate and could give it in heavier doses than the salicylates.

Dr. G. N. Ryan, Des Moines, Iowa: Considering these cases from the standpoint of infection, we should bear in mind the necessity of keeping the respiratory tract clean by the use of sprays of some alkaline solution; also of administering alkaline solution, sodium bicarbonate and glucose with a small catheter in the bowel for four hours slowly, then abstaining for four hours, and then giving it again. By using minute doses of atropin you can prevent this weakened condition of the heart and irregular heart that you find without stimulation. Creosote in vapor form seems to have considerable effect on the respiratory tract. The acid condition will soon disappear.

Dr. Meredith Johnston, New York: I thought I was having many cases of influenza until I had a large number of cases of otitis media. Twenty-two were examined by a bacteriologist, and in not one was the influenza bacillus found.

Dr. Lawrence P. Royster, Norfolk, Va.: I plead guilty to the use of the nonscientific expression "grip." I emphasized the fact that I was using the term because of an epidemic of supposed grip. I regret I was not in a position to make bacteriologic studies at the time, except of a single case of pyelitis I mentioned. We are dealing with a general infection, and that is as far as any one can go at this time. Dr. Abt spoke of the gastric type being an initial manifestation. I do not know but that it is part of a general toxic condition. It may be merely one of the predominant symptoms of this particular epidemic. The seasonal development of it is about as interesting as the so-called seasonal diarrhea; one occurs at one time of the year and the other another. That is all we know. I do not approve of sending children out of doors in bad weather. Generally speaking, fresh out-door air is better than closed houses. I did not make blood tests nor any bacteriologic tests for the reason that the cases occurred in very rapid succession in the course of a rather busy season and in a house-to-house practice. Unless the bacteriologic examination is undertaken under the most approved conditions no one can state what it is; there is so much contamination. Most of these cases are due to streptococci implanted on a mucous membrane of lowered vitality from some other condition. I find that these patients have abdominal pains, as they have pains in various parts of the body. I do not claim any treatment as being a specific.

Restriction of Investigation in Hospitals.—If one wishes to gain an idea of the reason why medical science advances so slowly and haltingly one has but to look at those who are at present the investigators and to consider their opportunities. To prevent or combat disease it is necessary to know its origin and its progress; and one has but to ask what opportunities our investigators have of seeing the disease invade the body, and of observing its progress, in order to estimate the amount of knowledge likely to be acquired by them. Investigation is chiefly carried on in the laboratories and in the wards of hospitals. No doubt in both places observations of the utmost importance are made; but what opportunities have these investigators of seeing disease in its early stages and during its progress? In the wards of the hospital, as you know, disease is not presented in its early stages, and the opportunity of watching its progress is limited to the short time the patient spends in the hospital. It is true that in the out-patient department many cases of disease in its early stages may present themselves, but here again the difficulty of following cases is well-nigh insuperable.—Sir James Mackenzie.

THE ULTIMATE RESULTS IN THE TREATMENT BY ARTIFICIAL PNEUMOTHORAX *

A. G. SHORTLE, M.D.
ALBUQUERQUE, N. M.

During the past four years there have been published in America numerous reports on the treatment of lung tuberculosis by artificial pneumothorax. These have proved beyond doubt the value of this procedure so far as the early symptomatic results are concerned, provided properly selected patients are operated on. It is well established that in induced pneumothorax, most remarkable and almost immediate symptomatic improvement will be brought about. High fever will be brought to normal, sputum is greatly reduced or abolished, cough disappears, the patient gains in weight and strength, and in many bilateral cases the râles in the working lung will soon disappear. This is certainly well established, but the question that has troubled every one of us who have used this procedure, I am sure, is whether the final result would be in any way comparable to the early improvement.

So far there has been practically nothing published on this, owing largely to two facts: First, there are only a few American operators who have used the procedure for any considerable time, and second, of the few who have, the majority have kept up collapse for long periods, fearing to let the lung reexpand.

In studying the discharged patient the points of most interest to me have been: the permanency of results, the patient's working ability, the condition of the reexpanded lung and the amount of contraction of the chest wall on the collapsed side. The study of these cases also does much to clear up what has been to all of us, I am sure, a most perplexing question: that of the time necessary to keep up the collapse.

Before taking up my own results I will as briefly as possible summarize the little that is to be found in the literature regarding discharged patients. Spengler,[1] reporting on eighty-two patients operated on by Brauer and himself previous to 1909, sets the following standard for a clinical cure: complete absorption of the pneumothorax for more than nine months, disappearance of fever, cough, bacilli and expectoration, and resumption of normal work. He finds fifteen cases meeting these requirements among the eighty-two. Saugman[2] reports as clinically cured fifteen patients who went without treatment for periods varying from one to seven years. Zink[3] reports thirty-one patients out of 110 treated as fully capable of working, and nine clinically cured and with the pneumothorax absorbed "for a long time." Wolff and Ehrlich[4] report four cases clinically cured and two without treatment for from three to fourteen months, respectively. They had treated forty-four cases altogether. Burnard[5] cites two or three cases without treatment for periods of six months, one year and two years to prove that clinical cures can result. Schertenberg[6] reports eight cases in which treatment has terminated for "several

* Read before the Section on Pharmacology and Therapeutics at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

1. Spengler: München. med. Wchnschr., 1911, lviii, 460.
2. Saugman: Beitr. z. Klin. d. Tuberk., 1913, xxxi, 571.
3. Zink: Beitr. z. Klin. d. Tuberk., 1913, xxviii, 155.
4. Wolff and Ehrlich: Fortschr. a. d. Geb. d. Röntgenstrahlen, 1915, xxii, 518.
5. Burnard: Rev. méd. de la Suisse romande, 1915, xxxv, 256.
6. Schertenberg: Russk. Vrach, Nov. 2, 1913.

months." Most of the patients have resumed work without inconvenience.

To obtain data from American operators, I wrote to some twenty who had used the method for a considerable period. The difficulty of keeping in touch with the discharged patient probably explains why only a very few could give actual results, though as Brauer has said, it is particularly hard to tabulate results in pneumothorax work, and each case should be studied by itself.

Floyd,[7] in 1913, said:

> Two years ago, in conjunction with Dr. Robinson, I reported twenty-eight cases treated by artificial pneumothorax. Of these some eight cases had either shown an entire arrest or were approaching that condition. Of these arrested cases six are in excellent condition today. One has died through no fault of the method, and one has within the past year shown an extension of the old process into the previously collapsed area of the lung.

Under date of May 21, 1916, Dr. Floyd writes me regarding those cases that "of the six I think at least three are in good condition still. The others I do not know about."

E. R. Baldwin has four patients who have been without treatment for periods varying from six months to two years and discharged as apparently arrested. All these are doing well.

Webb and Gilbert have eight patients who have been discharged with absence of symptoms, the periods varying from two months to twenty-seven months. None of these have relapsed.

Maurice Fishberg reports two deaths and three who have relapsed among seventeen considered well at time of discharge.

Drs. Ralph and Ray Matson write me that they have discharged eighteen patients between the dates of July 2, 1913, and May 15, 1916. Four were discharged as clinically well, nine as ambulant arrested, three favorably influenced, and two as relapsed. Three of these are now working.

There is great diversity of opinion in the matter of the time of collapse necessary for good results. Of course, this depends on the amount of involvement, whether there is a cavity, etc.; but assuming that practically all the patients operated on are third stage cases, the average time should be somewhat similar with all operators.

Spengler,[1] in reporting on fifteen cases showing clinical cure, gives the following time for treatment: one case two months, one case five months, six cases seven and one-half to ten months, three cases ten to sixteen months, and four cases eighteen to twenty-four months. He thinks the time required depends largely on the presence or absence of pleural adhesions and the occurrence of complications during treatment.

Saugman[2] reports that of twenty patients showing clinical cure, he treated one case less than one-half year, four cases one-half to one year, five cases one year to one and one-half years, eight cases one and one-half to two years, one case two to three years and one case three to four years.

Forlanini has written extensively on induced pneumothorax, but has said little that I can find on the subject of the length of time that collapse should be maintained. That he maintained collapse for long periods, however, is evident, for Balboni[8] quotes him as treating a woman for ten years, and in a paper[9] in 1910 he mentions five cases in which he had maintained collapse for periods varying from two to six years.

Dumarest and Murard,[10] reporting on thirty-eight cases for from six months to five years, say there are three cases of complete recovery, but the treatment had to be maintained five years. Wolff and Ehrlich[4] give the average time of treatment one year. Schertenberg[6] gives the average time of treatment as one to one and one-half years. Zinn and Geppert[11] report the average time one year or more.

Of American operators, Baldwin gives the average period that his patients were under treatment at approximately one and one-half years; Fishberg at nine months, and Francine and Klein at six to eight months. Webb and Gilbert's cases varied from one of only six months to one of forty-one months, but averaged nineteen months. They add, however, that "our best cases wish to continue the treatment indefinitely and we have seen no reason in our experience to advise them otherwise."

E. A. Gray gives the average time in successful cases at from one and one-half to two years.

In the matter of reexpansion and physical signs, Dr. Baldwin writes that reexpansion was complete in three cases but he had not seen the other case for over a year. The three cases had plenty of crepitant râles; he did not know about the fourth. Dr. Gilbert reported reexpansion complete or nearly so in all their patients, and that "râles and rhonchi return with the reexpansion of the lung in practically all cases we have studied."

Dr. Gray reports that some of his cases reexpanded and others remained permanently collapsed.

Certainly reexpansion is largely dependent on the amount of pleural involvement, and to a less degree on the amount of pressure used and the length of time collapse is maintained.

As stated, the purpose of this paper is to study the discharged patient. However, for the hearer properly to appreciate the results in the cases we have treated, a brief review of the cases treated would be desirable.

I shall deal with only 104 cases, the first of which began treatment in May, 1912, last in August, 1914. Twenty-five of these cases are to be eliminated as they proved inoperable, and are of interest only in showing that almost one case out of four had such extensive adhesion that operation was impossible. This leaves seventy-nine cases that allowed of sufficient collapse to produce therapeutic effects. Of the seventy-nine patients, thirty-five are dead; two were apparently made worse; eighteen were improved, and twenty-one were discharged and treatment stopped as being symptomatically cured.

Twelve of the eighteen marked "improved" are still under treatment.

Coming now to the twenty-one patients discharged as symptom free, nineteen were third stage, two were second stage cases, seventeen were progressive and four were stationary. Sputum was positive in all. All were febrile cases and all had tried the usual rest cure and climatic treatment. The majority were sanatorium cases and all had failed.

These patients have now been without pneumothorax treatment for the following periods: two over three years; four over two years; five over one and one-half years; six over one year, and four for six months or

7. Floyd: Boston Med. and Surg. Jour., 1913, clxix, 713.
8. Balboni: Boston Med. and Surg. Jour., clvii, 761.
9. Balboni: Riforma med., 1910, xxvi, 555.
10. Dumarest and Murard: Bull. méd., Paris, 1914, p. 15.
11. Zinn and Geppert: Beitr. z. Klin. d. Tuberk., 1915, xxxiii, 111.

over. There are only three of these cases that I have not heard from within six months, and as best I can learn, of the twenty-one cases the following describes their present conditions: Two have relapsed and died; one, a physician, gave up treatment earlier than we advised and returned to Connecticut and plunged into a heavy country practice. He got on well for about a year. The other went six months after treatment was stopped before having a hemorrhage that after about a week resulted in his death. This patient led what would be a very strenuous life for any well man. Of the remaining nineteen, fifteen are well and working, and three others were when last I heard of them; one is now ready for employment.

Of the nineteen patients living, six show rhonchi and râles after cough. Seven are negative; six I do not know about. Of thirteen cases I have measured for contraction on the collapsed side, it varies all the way from 2¾ inches to 1 inch, averaging about 1½ inches. All of our cases except three of the more recent ones have fully reabsorbed, as we have demonstrated both by physical examination and by the fluoroscope. Seven have no sputum whatsoever, two negative sputum and four positive; of the others I do not know. The apex beat in thirteen cases showed a displacement to the left averaging about 1 inch. In all these the left lung had been collapsed.

In the important matter of the time required for treatment, ours have varied from one who received gas for thirty-four months to one who took it for only four months. They have averaged fifteen and one-half months. Besides our twenty-one patients discharged as symptom free, there were six who were discharged very much improved and able to take up some employment. Of these six, three are still working and in good shape physically, though, of course, showing marked physical signs on examination. One has died and two are in poor shape physically.

SUMMARY

Out of seventy-nine patients receiving lung collapse, nineteen are today working and in good shape physically; a number of these are symptom free. Three others discharged as improved are working but show marked involvement of the lung. To the layman this may not appear as a brilliant result, but I am sure it will to any one who has treated third stage consumptives. A good proof of the class of patients operated on is afforded by the fact that of the twenty-five patients who proved to be inoperable on account of adhesions, sixteen are dead, and seven are living but in bad shape physically. Only two are working and only one is really any better. He was perhaps the most favorable case of the 104 patients that I attempted to operate on, and I attempted it only as he had been a long time on the cure and his finances were at a low ebb. In other words, of the inoperable patients only two, or 8 per cent., are working, and only one, or 4 per cent., is improved; while of the patients operated on, twenty-two, or about 28 per cent., are working and nineteen, or 25 per cent., are in good shape physically.

Our results appear to be much better than those of other operators. I can ascribe this only to the following factors:

1. Most of our patients have been treated in our sanatorium, where the complete rest so essential to good results can be enforced. I often feel with Saugman that the procedure should not be undertaken outside an institution.

2. Our patients have been largely of the more intelligent middle class, with sufficient funds to afford proper living conditions and with sufficient brains to lend intelligent cooperation.

3. They were all treated in a very favorable year-round climate.

4. This I consider important: They received small insufflation of gas, never exceeding 500 c.c., and as a rule 250 to 350 c.c. The habit of introducing 800 to 1,000 c.c. at one operation is always sufficient explanation to me why a given operator has not had success with artificial pneumothorax.

I should add that in two cases reported on, the collapse was started by other physicians, and in one it was maintained for the last few months by another operator.

In the treatment of all patients during the last three years, my co-worker and associate, Dr. LeRoy S. Peters, has had an equal part, and such success as we have had should be credited to him quite as much as to myself.

DUODENAL ULCER

REPORT OF A CASE IN WHICH OPERATION WAS FOLLOWED BY IMPROVEMENT *

H. M. McCLANAHAN, M.D.
OMAHA

A. D., girl, aged 7 years, came under my observation, Oct. 19, 1915. Three other children in the family were all well. This child was well until 5 years of age, never having had any acute disease. In September, 1913, she was taken acutely sick with severe pain in the stomach and persistent vomiting, first of the food contents, later of green mucus, very sour. The attack subsided in two days. The child was fairly well for six months, when she was taken with a similar attack. Then there followed another period of six months of fair health. Then in October, 1914, there was another severe attack, and this was followed on the second day by a very profuse bloody discharge from the bowels. The mother said the stool was black and she was entirely certain it contained blood. There was no tenesmus associated with this. Again the child recovered. The parents noticed that she was weak for a considerable time. During the year preceding my examination, there were four separate attacks of gastric pain and vomiting. The vomited matter after every attack consisted, first, of the undigested food, and later of green mucus. During the last attack—about three months before the child came under my observation—there was again considerable dark blood in the stool, one movement containing many small dark blood clots. In the intervals of all these attacks her appetite was fairly good and the bowels were regular. Sleep was good. The parents said that while they knew the child was growing in height, she had lost about 5 pounds in weight during the year. The weight at my examination was 42 pounds.

The child was thin. The skin was soft and fair and free from blemishes. Heart and lungs normal. Liver not enlarged. No evidence of organic nervous disease. Reflexes normal. Abdomen flat; no tenderness except in the region of the pylorus. Here there could be palpated a doughy mass slightly movable, irregular in outline but no nodules and tender on pressure. There was no icterus. The most interesting symptom was a distinct peristaltic wave, or rather a series of waves passing across the stomach from left to right. This symptom was readily induced by drawing the finger across the stomach. Parents stated they had often observed this symptom. It was not attended by pain. There was a slight secondary anemia, but no leukocytosis. The urine was normal except that it con-

* Read before the Section on Diseases of Children at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

* This article is abbreviated in THE JOURNAL by omission of a review of the literature. The complete article appears in the Transactions of the Section and in the author's reprints. A copy of the latter will be sent by the author on receipt of a stamped addressed envelope.

tained indican. No test for free hydrochloric acid in the stomach was made. Dr. John D. Reid, in his letter to me accompanying the patient, said he first noticed the peristaltic wave one year previous, but he could make out the pyloric mass before that time. I wrote Dr. Reid and I quote from my letter as follows: "From the history, presence of a mass at the pylorus, the fact that the child passed blood freely a year or more ago, and again recently, and the peristaltic wave, lead me to believe that we have a partial stenosis of the pylorus due either to an ulcer or malignancy. I told the parents that after what you had done I would advise an operation." The parents decided to wait, but returned to Omaha, Oct. 27, 1915, and the child was operated on, Oct. 28, 1915, by Dr. A. F. Jonas. I quote from Dr. Jonas' report to me of the operation as follows:

"The patient was placed under the influence of ether and the usual aseptic precautions were carried out.

"The abdominal walls were quite thin and a peristaltic wave, beginning over the left costal arch and extending toward the right and ending over the right rectus muscle, could be easily excited by tapping the abdominal wall in the epigastrium.

"A small mass could easily be felt about two fingers' breadths below the right costal arch and over the rectus muscle. A median incision disclosed a largely dilated stomach which crowded into the wound and could be lifted out on the abdominal surface.

"At the pylorus, there appeared a round circular thickening which involved the entire pyloric circumference. It was thick and firm and evidently was composed of a dense mass of connective tissue. It occupied the site of a healed duodenal ulcer.

"An attempt to invaginate the stomach, so as to enable the index finger to be pressed into the pyloric opening, indicated that the orifice was exceedingly small. The pyloric ring could not be stretched, and we evidently had a pathologic partial obstruction which retarded the escape of the gastric contents.

"A local plastic operation, at the pylorus, was out of the question on account of the large mass of new connective tissue; therefore, a posterior gastro-enterostomy was done. The operation was an easy one and involved no difficulties or complications. The patient made a good recovery."

She remained in the hospital ten days and returned home. During the first month, under a careful diet, she gained 9 pounds in weight. Then she was permitted to eat when and what she pleased and as a result she had four attacks of vomiting each lasting not more than twenty-four hours. Then, March 6, 1916, the parents wrote me that they were discouraged. I replied, telling them to put the case under Dr. Reid's care. I again wrote the doctor as to her diet, etc. From March 6 to June 1, 1916, she has been entirely free from any further symptoms and has made a steady gain in weight. Dr. Reid reported to me, June 1, that he had carefully examined the child, that the mass about the pylorus had entirely disappeared as far as he could determine by palpation, and that there was no tenderness on pressure.

COMMENT

After looking through the literature, my case seemed unusual in two particulars, namely, the appearance of the peristaltic wave and the tumor mass at the pylorus. Dr. Jonas informed me that, when he examined the mass, just beyond the pylorus, he could see radiating white lines showing through the adherent peritoneum, and at this point there was decided induration. From his extended experience he had no doubt that this was the site of a healed duodenal ulcer. The presence of the wave was to me evidence of spasm of the pyloric ring. Another evidence that the ulcer was duodenal, rather than gastric, was the clear history of intestinal hemorrhage and no evidence of hematemesis. The tendency to relapse in this case is evidence that recovery from operation does not mean recovery from the effects of the disease, that after operation medical treatment is important, indeed, essential to complete recovery. This thought has been well brought out by Dr. Sippy of Chicago. The steady improvement in the child's general health and the disappearance of the inflammatory mass is positive evidence that we were dealing with an ulcer and that the mass was not malignant.[1]

468 Brandeis Building.

ABSTRACT OF DISCUSSION

DR. E. E. GRAHAM, Philadelphia: Pyloric stenosis in children is not so uncommon as is ordinarily supposed. Some years ago I saw my first case of pyloric stenosis in an older child, and since then I have seen several cases of this type, some with, and some without, a tumor. Pyloric stenosis associated with duodenal ulcer may or may not be common; but I recall at least one series of cases of gastric ulcer. Dr. McClanahan's case is of unusual interest.

DR. C. G. KERLEY, New York: The peristaltic wave is a frequent indication of pyloric stenosis in infants but it is rarely found in older children. Dr. McClanahan was fortunate in that his case showed both the presence of a palpable tumor and the peristaltic wave. In my most recent case of hypertrophic stenosis in an infant aged 6 weeks, neither the operating surgeon nor I could feel a tumor through the abdominal wall. Nevertheless, on operation a pyloric tumor was found one inch in diameter. The difficulty that surrounds abdominal palpation in little children is considerable and because a tumor cannot be felt, it does not mean that such a tumor does not exist.

DR. JOHN ZAHORSKY, St. Louis: I recently had a case, a child four weeks old, which for several weeks vomited a great deal and complained of pain in the stomach. Once a little blood was demonstrable in the stool. Roentgen examination was not positive. We finally made diagnosis of duodenal ulcer. The boy got well. Most of the positive ulcer-diagnoses except those made from Roentgen examination, have been made postmortem. The chances are that these ulcers are comparatively common, but we do not diagnose them. If the ulcer is near the pylorus and involves the pyloric ring, stenosis will follow. If it does not involve the ring, we may have no further symptom, as in my case treated only a few months ago.

DR. HARRY LOWENBURG, Philadelphia: The peristaltic wave in Dr. McClanahan's case can be explained by the fact that he evidently was dealing with pyloric obstruction from some cause or other, either spasm, hypertrophy, or as he says, duodenal ulcer. I think it would be very interesting if he could make roentgenograms to find out whether the pylorus is functionating or not. In one of my earliest cases of pyloric stenosis a gastro-enterostomy was performed. Later I had roentgenograms made and they showed that the pylorus was not functioning, that the artificial opening was doing the work. This child, at the age of 8 years, is living and in good health. I probably have seen about thirty or forty cases of pyloric obstruction of one type or another. I have had about nine operated on. All had gastro-enterostomies done. I understand that of late pyloroplasties are becoming more

1. The following articles on gastric and duodenal ulcer in children will prove of interest:
Friedenwald, Julius: Am. Jour. Med. Sc., August, 1912.
Borden, Veeder: Am. Jour. Med. Sc., November, 1914.
Schmidt, W.: Berl. klin. Wchnschr., March, 1913, abstr., Arch. Pediat., xxx, 383.
Flesch, Herman: Jahrb. f. Kinderh., 1912, xxvi, No. 5; abstr., Arch. Pediat., June, 1913.
Bichat and Imfeld, in Cheinisse: Sem. méd., September, 1913; abstr., THE JOURNAL A. M. A., Oct. 4, 1913, p. 1332.
Holt, L. E.: Duodenal Ulcers in Infancy, Am. Jour. Dis. Child., December, 1913, p. 381.
Gerdine, Linton, and Helmholz, H. F.: Duodenal Ulcer in Infancy an Infectious Disease, Am. Jour. Dis. Child., December, 1915, p. 397.
Cackovi, M. V.: Arch. f. klin. Chir., June, 1912; abstr., Arch. Pediat., xxix, 630.
Lansier: Thèses de Paris, 1908, 1909; abstr., Brit. Jour. Dis. Child., October, 1909.
Zentralbl. f. d. ges. Therap., September, 1909; abstr., Arch. Pediat., May, 1910.
Lockwood: Pediatrics, March, 1914.
Smithies, F.: Gastric Ulcer Without Food Retention, Am. Jour. Med. Sc., March, 1913, abstr., THE JOURNAL A. M. A., March 29, 1913, p. 1025.
Sippy, B. W.: Gastric and Duodenal Ulcer, THE JOURNAL A. M. A., May 15, 1915, p. 1625.

popular—the Ramstedt operation as modified by Strauss of Chicago, for instance. Dr. Strauss reports very good results, but pediatrists and surgeons whom I have spoken to feel that it is a difficult operation, except when performed by Strauss himself, perhaps. Surgeons generally seem to feel that the Ramstedt operation is not the thing to do. I saw one about two weeks ago in which the operator, instead of going down to the mucosa, included the mucosa in his incision. In that case gastro-enterostomy had to be done anyway. From results in my own cases I should be led to prefer posterior gastro-enterostomy.

DR. COLLINS H. JOHNSTON, Grand Rapids, Mich.: Last fall Dr. Richard Smith did the Strauss operation on a four months' old baby, the first case that ever lived in our city. The operation is not especially difficult and there was not much shock following it. We think Strauss' method is a very good one.

DR. J. H. HESS, Chicago: In our own hospital we have had very hard luck with gastro-enterostomy, and this led Dr. Strauss to undertake his work on the pylorus. I think we have had twelve operations to date, of which ten were done by Dr. Strauss, and in six of these operations I was present. He usually has a physician present to wash out the stomach, which accounts for my presence. His patients, with one exception, are all living. The operation itself, when understood, I think is a fairly simple one. The advantage it has over the Ramstedt operation is questionable in possibly 50 per cent. of the cases; in the other 50 per cent. it has a real advantage, because he reduces the size of the tumor, and at the same time enlarges the pyloric orifice.

DR. H. W. MCCLANAHAN, Omaha: Much of the discussion applies to another condition. In the case I have reported, the peristaltic wave was to me an unusual symptom as the mass was no doubt an inflammatory exudate. As soon as the source of irritation was removed, the exudate was absorbed. We did not have a roentgenogram made because so long as the little girl was quite well, the father did not see any reason for making it.

DEATH RATE IN ACUTE INFECTIONS

A STUDY OF THE MORTALITY IN PHILADELPHIA DURING 1911-1915 FROM MEASLES, PERTUSSIS, DIPHTHERIA, SCARLET FEVER AND TYPHOID FEVER *

EDWIN E. GRAHAM, M.D.

PHILADELPHIA

Through the courtesy of the bureau of health, I have secured a record of the deaths from these acute infections during the past five years; and, while this record may possibly be incomplete, owing to the failure of physicians to recognize or report some cases, yet the study of these statistics will lead to several interesting conclusions.

In one or two diseases the conclusions arrived at on comparing the number of deaths from these diseases will differ from the general opinion concerning the mortality from these maladies. The most effective method of demonstrating this mortality is to group the fatalities according to the ages at which they occur.

In considering the deaths among infants less than 1 year old, we find that pertussis was responsible for the greatest number, this having caused more fatalities than measles, diphtheria or the dreaded scarlet fever. Measles shows the next highest mortality, although the number of deaths does not greatly exceed those caused by diphtheria in infants of this age. Excepting typhoid fever, which is rare in infants, scarlet fever caused fewer deaths in this period of early infancy than any of the acute infectious diseases in this series.

In later infancy, also, scarlet fever caused but few deaths, for the mortality among babies from 1 to 2 years of age was only 10 per cent. of the mortality from scarlet fever at all ages, while the actual number of deaths from scarlet fever was less than from any of the other acute infections excepting typhoid fever.

During the second year, diphtheria showed a uniformly high mortality, and caused more deaths than either measles, pertussis, typhoid fever or scarlet fever. More deaths occurred from measles among infants from 1 to 2 years of age than at any other period of life, a fact which should make us more careful to protect the younger children of the family in which this disease appears. Pertussis, while not as fatal after the first year, also showed a high mortality rate—higher, perhaps, than is generally appreciated—and indicates the gravity of this disease, which is too often spoken of as harmless.

TABLE 1.—DEATHS FROM SCARLET FEVER, MEASLES, DIPHTHERIA, WHOOPING COUGH, AND TYPHOID FEVER AT DIFFERENT AGES

	1911	1912	1913	1914	1915
Under 1 year:					
Scarlet fever	7	3	3	4	1
Measles	72	7	49	19	45
Diphtheria	33	26	22	19	24
Whooping cough	41	53	51	135	18
Typhoid fever	0	0	0	0	0
From 1 to 2 years:					
Scarlet fever	19	8	13	0	0
Measles	104	19	86	22	81
Diphtheria	93	77	87	72	70
Whooping cough	37	18	25	74	17
Typhoid fever	4	3	2	1	0
From 2 to 5 years:					
Scarlet fever	85	55	71	60	8
Measles	96	21	53	20	38
Diphtheria	229	163	152	141	119
Whooping cough	32	22	22	45	10
Typhoid fever	10	7	10	5	2
From 5 to 10 years:					
Scarlet fever	39	34	54	34	4
Measles	20	2	7	4	4
Diphtheria	100	79	79	70	68
Whooping cough	5	6	8	10	2
Typhoid fever	14	7	13	8	5
From 10 to 15 years:					
Scarlet fever	7	6	9	5	3
Measles	4	0	1	1	0
Diphtheria	10	12	8	9	10
Whooping cough	0	0	0	1	0
Typhoid fever	15	18	17	12	13
From 15 to 20 years:					
Scarlet fever	7	1	2	4	2
Measles	4	1	0	0	1
Diphtheria	2	5	1	1	4
Whooping cough	0	1	0	0	0
Typhoid fever	24	29	26	17	19
All ages:					
Scarlet fever	179	113	162	129	25
Measles	305	50	199	77	167
Diphtheria	481	388	361	323	188
Whooping cough	116	100	106	266	67
Typhoid fever	223	200	255	124	109

Typhoid fever, which caused no deaths in infants under 1 year of age, showed the lowest mortality of all the acute infections in infants from 1 to 2 years of age, the total number of deaths recorded being but ten. The number of deaths from typhoid in infants of this age has steadily decreased for the last five years, having dropped from four in 1911 to none in 1915.

From the second to the fifth year, diphtheria caused more deaths than all of the acute infections in this series combined. Scarlet fever showed the next highest mortality at this age as compared with the number of deaths caused by the other acute infections in this series; it also caused more deaths among children between 2 and 5 years of age than at any other period of life. The total number of deaths from scarlet fever between 2 and 5 years of age does not, however, greatly exceed the mortality from measles at this period;

* Read before the Section on Diseases of Children at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

hence we must conclude that measles is a serious disease in children from 2 to 5 years of age.

Whooping cough caused almost as many deaths in children between 2 and 5 years of age as in those under 2 years of age; therefore it must be regarded as serious during the first five years of life. Typhoid fever presents an ever-increasing mortality as the child grows older; hence we find that the number of deaths in children from 2 to 5 years exceeds the number of deaths in infancy, and each year shows a greater mortality until early adult life, when the greatest number of deaths from typhoid occur.

Between 5 and 10 years of age, diphtheria caused more deaths than all the other acute infections together, so that from the second to the tenth year the mortality from diphtheria is higher than that of all the other acute infections combined. The mortality from scarlet fever in children of this age is less than half that of diphtheria during the same period, but greatly exceeds the mortality from either measles, pertussis or typhoid fever at this age.

Typhoid fever stands third in the mortality lists of children at this age, although this mortality is but slightly higher than in the preceding period. Measles loses its virulence as the child grows older, causing less than 20 per cent. of the number of deaths in children from 5 to 10 years of age as compared with children from 2 to 5 years of age. The mortality from whooping cough also decreases steadily after the fifth year, and in children from 5 to 10 years old is less than one fourth of that in the preceding period (from 2 to 5 years).

In children from 10 to 15 years of age the mortality from these acute infections forms a striking contrast to the mortality from the same diseases in infants under 1 year of age. Whooping cough, which leads as a cause of death before the first year, causes practically no mortality in children over 10 years of age, only one death in five years being recorded in children from 10 to 15 years of age. On the other hand, typhoid fever, which caused no deaths in infants under 1 year of age, shows a higher mortality rate in children between 10 and 15 years than any other of these acute infections.

Deaths due to diphtheria, among children of this age, rank second, and more than equal the number of deaths from scarlet fever, measles, and whooping cough combined. The mortality at this time of life from scarlet fever is very low, and but slightly exceeds that of measles, while the number of deaths from pertussis is practically nil, only one fatality being recorded in five years.

Between the fifteenth and twentieth years there was an appreciable increase in the number of deaths from typhoid fever, and but one fatality due to whooping cough. Scarlet fever caused the second highest number of deaths, and diphtheria ranked third, while measles for the five years of this period showed but six deaths. Fatalities from the acute contagious diseases are very few after the fifteenth year, and the mortality from all of them combined does not equal that of typhoid fever in young people of the same age during the five years which these records cover.

I wish particularly to call attention to the number of deaths due to scarlet fever during these five years from 1911 to 1915, inclusive, at the different ages. The total number of deaths from scarlet fever at all ages for the five years was given as 608, but is slightly more, since the records for 1914 and 1915 of fatalities in children between 1 and 2 years of age are incomplete. Of these 608 deaths, 279, or 45 per cent., occurred between the second and fifth years, and the next highest number, 185, or 30 per cent., occurred in children from 5 to 10 years of age. In the first year of infancy, the mortality from scarlet fever, compared with the mortality from scarlet fever at all ages, is 3 per cent.; from the first to the second year it is about 10 per cent.; after the tenth year it drops to 5 per cent., and after the fifteenth year it is only 2.6 per cent.

Comparing this total of 608 deaths from scarlet fever in children of all ages for the five years, 1911 to 1915, inclusive, with the total mortality from all of the other acute infections, at all ages and for the same period of time, we find it less than any one of them, notwithstanding the dread of scarlet fever in the public mind. The deaths from pertussis, which is looked on in an entirely different light, number 655 for all ages during the five years, which is slightly more than from scarlet fever.

According to Dr. Paul Luttinger, of the Bureau of Laboratories, New York City, in pertussis the highest incidence and mortality — 56 per cent. — have been observed among females, the incidence and mortality in males being 44 per cent. This has been attributed to anatomic differences in the construction of the larynx, and is, perhaps, also due to a nervous system which is more susceptible in girls than in boys. The influence of sex is apparent at all ages, and it would appear from our present knowledge that it becomes more evident the older the girls are.

It is difficult to state positively what the true case incidence mortality is. All cases of pertussis are not reported, especially the mild and atypical ones. The law, in Pennsylvania, placards the house, but excludes from school only the children who actually have the disease, allowing the other children to go to school if they are free from symptoms. If this law were better understood by physicians and the laity, more cases would undoubtedly be reported.

The true case mortality, when one includes the mild and atypical cases, is certainly much less than statistics ordinarily indicate.

Diphtheria is in reality the most fatal of the acute infections in this group, since it caused approximately twice as many deaths as any of the others, the total number being 1,741 for all ages during the years 1911 to 1915, inclusive. Typhoid fever caused the next highest number of deaths for all ages in this group; but the fatalities probably do not now rank second, as the mortality dropped during the years 1914 and 1915 to one half of the rate for the three preceding years, and it is only reasonable to assume that it remains at this low figure.

The fact that measles at all ages during this period of five years caused more deaths than either scarlet fever or whooping cough would, perhaps, if more widely known among the laity, tend to prevent the spread of the disease, and do much to break up the popular habit of allowing children to contract measles at the first opportunity "because they are sure to get it sometime, anyway."

For the fuller comprehension of the mortality returns in the acute infections with which this paper deals, it seems advisable to compare the number of deaths with the number of cases of these diseases which were reported, as in Table 2.

During the five years from 1911 to 1915, there were 50,715 cases of measles reported; that is, more than

one and a half times as many cases as of pertussis, typhoid fever, scarlet fever and diphtheria combined; yet of all these diseases, measles ranked only third in the number of deaths it caused, the mortality, 798, being only 1.1 + per cent.

Next in the largest number of cases was diphtheria, 14,720 cases being reported for these five years, with 1,741 deaths, which gives a mortality of about 11.8 per cent. The bureau of health, in its annual report for 1914, states that during the last ten years the case death rate of diphtheria has not changed more than 1 per cent., notwithstanding the use of antitoxin, and the bureau of health attributes this to the late recognition of the disease by the parents rather than to a lack of efficient treatment by the medical profession.

Scarlet fever was the third most prevalent disease in this series, 11,216 cases being reported, although the number of deaths resulting was less than from any of the other diseases. The bureau of health makes the observation that in the years when there were most cases of scarlet fever the mortality was lower; but when the number of cases was fewer, the mortality was higher. The total number of deaths, 608 among 11,216 cases reported, gives a mortality rate of 5.4 per cent.

There were 9,461 cases of whooping cough reported during these five years, or nearly 2,000 less than the number of scarlet fever cases; yet the number of deaths, 655, was greater, and the mortality rate slightly less than 7 per cent.; that is, 1.6 per cent. higher than for scarlet fever during this same period.

TABLE 2.—PERCENTAGE OF DEATHS TO TOTAL NUMBER OF CASES OF MEASLES, DIPHTHERIA, SCARLET FEVER, WHOOPING COUGH, AND TYPHOID FEVER FROM 1911-1915, INCLUSIVE

	1911	1912	1913	1914	1915	Number of Cases	Number of Deaths	Percentage of Deaths to Cases
Measles	11,640	2,279	15,611	7,666	14,089	50,715	798	1.1+
Diphtheria	3,792	3,080	2,623	2,610	2,615	14,720	1,741	11.8
Scarlet fever	1,978	2,872	3,400	1,944	1,072	11,216	608	5.4
Whooping cough	1,410	1,369	1,438	4,152	1,092	9,461	655	7.0—
Typhoid fever	1,382	1,514	1,668	798	787	6,174	911	14.5
Totals	.....	....	.....	....	.....	92,286	4,713	

The number of cases of typhoid fever reported from 1911 to 1915, inclusive, was 6,174, and the number of deaths 911, giving a mortality rate of over 14.5 per cent., which is higher than that of any of the other acute infections that we have considered. In our discussion of the number of deaths from typhoid and the ages at which they occurred, we noted the fact that the number of deaths decreased to one half in the years following 1913, and in summing up the number of cases reported during these five years we find that in 1914 and 1915 only half as many cases were recorded as in 1911, 1912 and 1913. This is largely attributed by the bureau of health to the removal of the dual systems of water supply which existed in several manufacturing establishments in 1913, and the subsequent stopping of intermittent contamination of the city mains. The pasteurization of our milk supply has also been undoubtedly an important factor in diminishing the cases of typhoid fever during childhood.

Of all the diseases considered in this article, diphtheria caused the most deaths during the five years 1911 to 1915, inclusive, and typhoid fever, measles, pertussis and scarlet fever followed in the order named.

With respect to the prevalence of these diseases, measles led by a great majority over all the rest combined, while diphtheria, scarlet fever, whooping cough and typhoid fever followed in the order mentioned. The disease with the highest death rate was typhoid fever, while diphtheria, whooping cough, scarlet fever and measles showed the next highest mortality rate in the order given.

ABSTRACT OF DISCUSSION

Dr. Isaac Abt, Chicago: More children fall ill with measles than with scarlet fever—the chart shows 50,715 cases of measles to 11,216 cases of scarlet fever. My impression would be, the immunity against measles is less than the immunity against scarlet fever. I wonder if it might not be explained in this way. Many a child with sore throat may really be infected with the organism of scarlet fever, and yet not show skin reaction. Another point in reference to scarlet fever is, according to the geographers, epidemics both mild and severe occur. Year after year mild epidemics will occur, and then some year a severe epidemic, almost a pan-epidemic, will occur, the number affected is very large, and the mortality is very great. The point that I desire to make is that the severity of measles from year to year is uniform, that it makes definite symptoms and rarely remains unrecognized; whereas in scarlet fever the symptoms vary from mild to severe, and I am of the impression that scarlet fever occurs more frequently as an unrecognized disease than we commonly suppose. Just a word about diphtheria. It is a sad commentary, not only as to Philadelphia, but as to all of our cities, that a disease which can be cured by specific treatment should present such a high mortality. It seems to me we are partly responsible and the parents are partly responsible. Frequently we are not called to see the case until the disease is far advanced. Our responsibility depends on the fact that we do not make diagnoses earlier. We are prone to wait for the report from the bacteriologic laboratory; this is time consuming. The laboratory report itself may sometimes be fallacious. It not infrequently happens that the culture is positive for Klebs-Löffler bacilli on the second or third examination. I would make a plea for more careful and accurate clinical diagnoses of diphtheria. Our predecessors had definite ideas as to the clinical appearance of the membrane in diphtheria. Their diagnostic accumen on this subject was accurate, they recognized a diphtheritic membrane when they saw it. When the membrane is diffuse, pearly white, or in the later stages, of a cream color, encroaching on the midline of the pharynx or the uvula with beginning stenosis of the larynx or with nasal involvement indicated by a thick albuminous bloody discharge, under such circumstances a real clinician need not wait for a bacteriologic examination. The antitoxin should be administered forthwith. It seems to me occasionally we lose sight of the clinical signs and depend too much on the laboratory.

Dr. G. G. Copeland, Toronto, Canada: The points that should strike home are the frightful mortality of measles and whooping cough. That is not generally appreciated throughout the profession, either in Canada or the United States. I should like to ask Dr. Graham: What are the relative proportions of children under 1 year of age who have contracted these diseases that are breast fed, as compared with those artificially fed? I believe the mother's milk protects the infant.

Dr. Jessie M. McGavin, Portland, Ore.: I think it is especially important to give the antitoxin early, without waiting for the laboratory report. In Portland twelve hours elapse before we can get a report from the laboratory. In some cases we may have the clinical appearance and yet the laboratory report may be negative. I think antitoxin should be given on suspicion of diphtheria. In several instances lives were saved by the use of antitoxin when the laboratory reports at first were negative. Therefore I give antitoxin on the clinical findings.

Dr. C. F. Hoover, Cleveland: Recently I gathered statistics on the mortality of whooping cough and I found that, according to German statistics, it was 25 per cent. under 1 year

of age. I believe statistics given from the California State Health Department recently show a death rate of 2 per cent. from whooping cough under 1 year of age. One other thing I noticed was that the locality had much to do with the mortality of whooping cough. In the higher altitudes it is much more fatal. For instance, in North Carolina the mortality of whooping cough is greater than of all the other infectious diseases combined.

DR. L. T. ROYSTER, Norfolk, Va.: I think delay on the part of the physician to obtain a positive culture undoubtedly is responsible for many deaths, and we should urge young medical men to base their diagnoses and beginning of treatment on clinical symptoms. Long before I was in the State Department of Health, when Dr. Dixon organized the department in Philadelphia, he declined to permit the use of the laboratory for the diagnosis of diphtheria. From 12 to 24 hours and in remote sections, 36 hours, elapse before the positive diagnosis is made. That very often means life or death to the patient. It is much wiser to administer the antitoxin early on a clinical diagnosis rather than to wait for the laboratory report. Another cause for the high mortality is the increasing number of various cults, practiced by people not trained in diagnosis, who are pretending to treat people for conditions they know nothing about. In Philadelphia at present they are having an extremely mild type of diphtheria with a low death rate. A few years ago, I think in 1910, we had an importation of a new strain—a type prevalent in southern Europe in the vicinity of Vienna and the Slavish sections of Europe for a number of years. Examination of the case records revealed that they were having a death rate in Vienna of 18 per cent., while we were having a death rate of only 7 per cent. I think our death rate in hospitals now is only about 2 per cent. I have been trying to determine whether the mixed streptococcic serum might be helpful in the treatment of these cases. In Vienna they got some improvement in cases treated with this serum. Scarlet fever does not yield to public health control at the present time as we would like to have it do. The case rate and mortality fluctuates in spite of all our present methods, just as the case rate and mortality rate in measles fluctuates. In diphtheria with the free use of antitoxin the death rate has steadily declined. Although I am much in favor of giving antitoxin and not waiting for laboratory diagnosis, I would like to put in a plea for the taking of cultures in every case of sore throat. It only takes four or five hours for the culture to grow. We can get the culture findings sometimes before we can get our clinical manifestations.

DR. C. G. KERLEY, New York: The subject is a very large one and it is impossible to discuss it very fully. The work done by Dr. Graham is very complete and it will be a great advantage to our knowledge of the subject. I feel it would have been better if those between 15 and 20 years of age had been left out. After the fifteenth year, the individual is not a child and hardly should be included in statistics on children. The mortality from diphtheria is high as well as that of typhoid. The same trouble evidently exists in Philadelphia as in New York, namely, the impossibility of seeing cases of diphtheria early. The child not being particularly ill at the onset of the disease, renders the disease very dangerous. We are called to see our tonsillitis cases much sooner than we see those ill with diphtheria for the reason that in tonsillitis there is the high fever, prostration and symptoms of urgent illness, whereas in early diphtheria the child appears only slightly ill and he is often three or four or five days treated by home methods before the physician is called. The fatal issue among the poorer people is not at all unusual in children who have been in bed but a day or two.

DR. F. D. BARKER, Dayton, Ohio: I would like to emphasize one practical point referred to by Dr. Royster, the distressing persistence of scarlet fever in epidemics. In April more than 40 per cent. of cases of scarlet fever in Dayton were in families in which the scarlet fever was persisting or recurring. A careful study showed that they were not persons who had become infected at the same time as the first patient who had recovered. The source of infection evidently had been overlooked. The original patients were well and not included in these statistics, but the source of infection was persistent.

DR. E. E. GRAHAM, Philadelphia: I tried to emphasize the importance of treating diphtheria from a clinical rather than from a laboratory standpoint. Of course, we make our diagnosis in either laboratory or clinical study, but if the case were treated from a clinical standpoint rather than from a laboratory standpoint, the mortality would be much reduced. In regard to whether pertussis in the first year occurs more largely in the breast-fed or bottle-fed, I have no records. I should, however, suppose that, the breast-fed child being more robust and better able to resist infection, such a record would show fewer deaths in these than in bottle fed. To show just what relation they bore to childhood as well as to early adult life is the reason I included the patients over 15. The mortality of typhoid I do not believe is as high as that record would indicate. Mild cases are probably overlooked in children.

FRACTIONAL DETERMINATION OF GASTRIC SECRETIONS*

ERNEST C. FISHBAUGH, A.M., M.D.
LOS ANGELES

The fractional determination of gastric digestion had its inception among students of stomach physiology, and as early as 1895, Schüle[1] presented curves of gastric secretion. These were formulated by plotting the amount of acid, free, combined and total, found on the titration of gastric juice withdrawn at fifteen minute intervals during the cycle of digestion. From his observations on healthy persons he arrived at the following conclusions: 1. "Values of the free as well as the combined hydrochloric acid and of the total acidity differed considerably in the same individual and in different people, too, without demonstrable cause." 2. "Height of digestion occurs sixty minutes after the Ewald test breakfast, varying in individual cases from forty-five to seventy-five minutes."

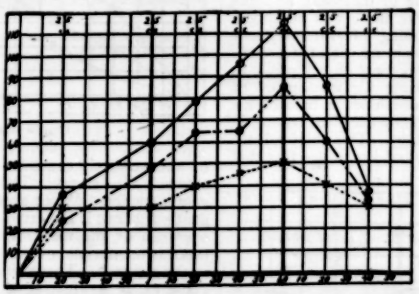


Chart 1.—Chart of Mr. R. L. S. In this and the following charts, unless otherwise noted, the hollow dots and solid line indicate total acidity; solid dots and broken line, free hydrochloric acid; crosses and line of dashes, pepsin, 10 = 1 mm.

Hayem[2] later did splendid work by removing specimens at intervals with the stomach tube. The procedure of frequent introduction of the stomach tube naturally caused a difficulty in securing subjects.

The excellent experiments of Pawlow[3] have for a number of years stood almost unquestioned as repre-

* Read before the Southern California Medical Society, May 3, 1916, Pomona, Calif.

1. Schüle: Ztschr. f. klin. Med., 1895, xxviii.
2. Hayem: Maladies de la tube digestive, Brouardel and Gilbert, 1905.
3. Pawlow: The Work of the Digestive Glands, 1910.

senting clear evidence of the exact nature of gastric secretion. These experiments were performed on animals, chiefly dogs, and the digestive cycle observed has been almost unqualifiedly applied to man. This application does not seem justifiable since the functions recorded on a traumatized stomach must be more or less perverted.

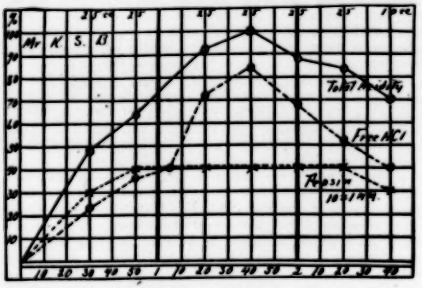


Chart 2.—Mr. K. S. B.

Even the well known observations on the famous case of Alexis St. Martin, as regards the cycle of digestion and gastric secretions, cannot be directly applied to the function of the nontraumatized human stomach.

Bourget[4] was not the first clinician to insist that the untraumatized human stomach must be studied directly and in a normal condition and that the universal application of animal experimentation to man must be modified; otherwise the physiology of the human stomach would not progress.

Until the last couple of years, little advance had been made in the study of the cycle of digestion, and this was chiefly due to the fact that there was no simple and practical method of obtaining interval specimens of a test meal except by the repeated use of the stomach tube. This, of course, was most objectionable to the patients. Rehfuss,[5] realizing the inadequacy of the ordinary stomach tubes, developed a tube of his own and has since presented many excellent studies in gastric physiology and pathology. The chief advantage of the tube which he devised lay in the fact that

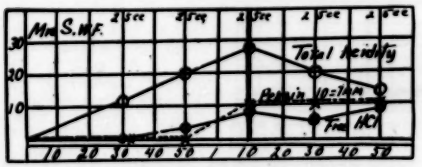


Chart 3.—Mrs. S. W. F.

the metal tip contained slitlike openings, each of which was equal in width to the diameter of the small rubber tube. The increased size of these openings made aspiration somewhat easier than when the tip contained only small perforations. The Einhorn duodenal tube and many others of a similar type can be successfully used in the same manner, but with less ease than the Rehfuss tube.

4. Bourget: Maladies de l'estomac, Ed. 1, 1913, p. 3.
5. Rehfuss: Am. Jour. Med. Sc., June, 1914, p. 848.

Rehfuss, Bergeim and Hawk[6] found in healthy medical students that "each individual exhibits a certain tendency in the elaboration of his secretion, and this tendency is the same be the stimulus an Ewald meal, water or meat." They found that the acidity figures for the various stimuli were approximately the same. They found, furthermore, that even though there was a variation in the figures, the type of curve persisted in that individual.

The technic followed in this study has been, in the main, that of Rehfuss,[7] with variations in details only. Forty gm. of water crackers with 10 ounces of water, about 2 ounces of which were reserved to be swallowed with the tube, were given as a test breakfast. Usually about ten minutes were required for the ingestion of the crackers and water. Immediately the tube was swallowed with the remainder of the water. The excess of saliva which formed rapidly during the first few minutes was expectorated. If the saliva was swallowed, it interfered materially with the ease of the aspirations. After the first few minutes the patient suffered no inconvenience with the tube in his mouth. The patient was placed at ease—either sitting or lying down, and urged to read or otherwise divert his attention. At twenty minute intervals, from 15 to 25 c.c.

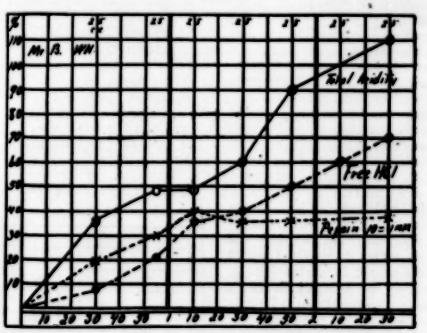


Chart 4.—Mr. B. W. N.

of the stomach contents were withdrawn until the stomach was empty. The aspirations were made by gentle suction. When aspiration was not possible by gentle suction, it indicated that the tube was occluded, openings of the metal tip were covered by folds of mucous membrane, or the tip was above the fluid level in the stomach. These difficulties were as a rule overcome easily by forcing a little air into the tube, by varying the amount of tube swallowed or by changing the position of the patient. The stomach was considered empty when no more fluid could be aspirated with the patient placed in the dorsal, right and left lateral and often the knee-chest positions.

The material from each aspiration was filtered and measured off by means of a graduated pipet. Phenolphthalein was used as an indicator in determination of the total acidity, and dimethylaminoazobenzene for the free hydrochloric acid, and each titrated with tenth

6. Rehfuss, M. E.; Bergeim, Olaf, and Hawk, P. B.: Gastro-Intestinal Studies, I, The Question of the Residium Found in the Empty Stomach, The Journal A. M. A., July 4, 1914, p. 11.
7. Rehfuss, M. E.; Bergeim, Olaf, and Hawk, P. B.: Gastro-Intestinal Studies, II, The Fractional Study of Gastric Digestion, with a Description of Normal and Pathologic Curves, The Journal A. M. A., Sept. 12, 1914, p. 909.

normal sodium hydroxid. The pepsin was determined by adding to an undiluted portion of each filtrate a Mette tube, and measuring at the end of twenty-four hours the amount of digestion, by means of a millimeter rule and a magnifying lens.

In reviewing the fractional studies of sixty-five gastric cases, the value of the interval method of stomach analysis becomes evident. The ordinary one hour examination evidences a single moment in an ever changing cycle of stomach activity. The one hour examination not only affords insufficient information but also gives data which frequently are misleading or entirely incorrect. Irrespective of symptomatology and physical diagnosis, it was noted that aside from emphasizing the value of the method, the curves of stomach secretions fell into three general classes.

1. Stomach secretions whose curves fall toward the end of gastric digestion.

2. Stomach secretions whose curves rise to the end of gastric digestion.

3. Stomach secretions absent or delayed.

Group 1. Stomach Secretions Whose Curves Fall Toward the End of Gastric Digestion: Of the sixty-five cases, twenty-six exhibited a fall in the secretory curves toward the end of gastric digestion.

Chart 1 represents this sort of curve. The secretions began early in the cycle, and at the end of one

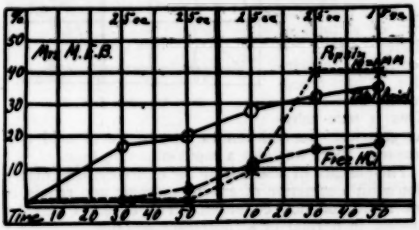


Chart 5.—Mrs. M. E. B.

hour there was a free hydrochloric acidity percentage of 48 and a pepsin digestion which had gradually increased to 3 mm.; but the acidity as well as the enzyme continued to rise until at the end of two hours there was a free hydrochloric acidity of 85 and a pepsin digestion of 5 mm. During the next forty minutes there was a gradual fall in acidity and enzyme. In this case the enzyme digestion followed the acidity curve very closely.

Chart 2 shows a similar type of curve, the highest acidity figures being reached at the end of one hour and forty minutes. It differs from Chart 1 in that the pepsin does not follow the acidity curve. At the end of fifty minutes the pepsin digestion was 4 mm. and remained at that level, although in the next fifty minutes the free as well as the total acidity more than doubled in percentage.

In this group of cases the height of acidity varied from the high figures in the foregoing curves to the very low acidity and enzyme curves shown in Chart 3.

This type of curve is represented by all graduations from the hypacidity to the hyperacidity, and from the hyposecretion to the hypersecretion. In only four cases of the twenty-six was the free hydrochloric acid at its height within one hour after ingestion of the test breakfast. In the remaining twenty-two cases the height of the free hydrochloric acid curve was reached at varying lengths of time up to two hours and forty minutes after the breakfast. On an average of the twenty-six cases the height of the free acidity curve was reached one hour and thirty-one minutes after the meal, thereby showing that the height of secretion is missed by the one hour examination in a very high percentage of the cases. In this group the highest

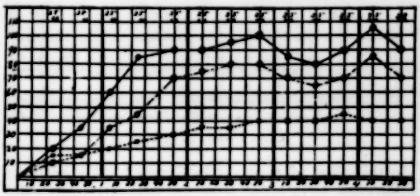


Chart 6.—Mrs. A. G. A. Crosses and line of dashes indicate pepsin digestion, 10 = 1.

acidity percentage of free hydrochloric acid varied from 8 to 88, with an average of 52.2.

A question naturally arising is, Why a fall in the secretory curve toward the end of gastric digestion? It would seem that two factors must be considered preeminently:

1. A portion of the acidity may be neutralized by the meal itself. A quantity of water crackers were well mixed with a standard solution of hydrochloric acid, tenth normal, and allowed to stand at room temperature for varying lengths of time when portions were filtered and the filtrate titrated against tenth normal sodium hydroxid. It was thereby found that this factor could be eliminated as a cause of the fall in the curve toward the end of digestion in the stomach.

2. During digestion the secretory activity in enzymes and acid is dependent on a stimulus, psychic, chemical or reflex, and as the stimulus disappears there would naturally follow a fall in the secretions. In this group of cases it would appear that such a condition was present and that toward the end of gastric digestion the glands of the stomach continued to secrete, but

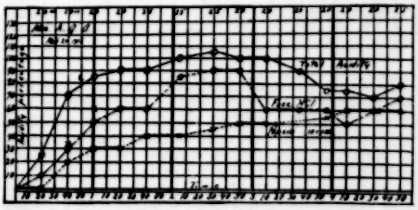


Chart 7.—Mrs. A. G. A., March 24, 1916.

produced a juice decreasingly poor in enzyme and acid constituents, thereby diluting the once concentrated solution and producing a fall in the curves.

Group 2. Stomach Secretions Whose Curves Rise to the End of Gastric Digestion: Of the sixty-five cases, twenty-four fell into a class where the acidity figures continued to rise until the stomach was empty. Chart 4 represents this type of curves with rather high acidity figures. At the end of one hour there was a

free hydrochloric acidity of only 36 per cent., but by the time the stomach was empty the percentage of free hydrochloric acid had doubled and the total acidity had more than doubled. The pepsin reached its highest point at the end of one hour and ten minutes.

Chart 5 shows a similar type of curve, but with low acidity figures. The ferment pepsin did not appear until after the free hydrochloric acid.

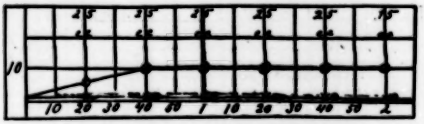


Chart 8.—Mr. A. C. E.

In this class of cases, as in Group 1, all gradations of secretion were noted from the hyposecretion to the hypersecretion and from the hypacidity to the hyperacidity. The emptying time varied from one hour to four hours and fifty minutes, with an average of two hours and seven minutes. The highest free hydrochloric acid figures varied from 16 to 90, with an averave of 56 acidity per cent. The highest point in the free hydrochloric acid curve was reached at periods varying from sixty minutes to four hours and fifteen minutes, with an average time of one hour and fifty-one minutes for the twenty-four cases. In only two cases were the highest acidity figures found at the end of the first hour. So in only two instances would the one hour examination have given an accurate information regarding the highest acidity.

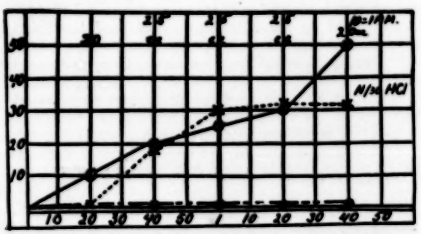


Chart 9.—Mrs. C. O. H.

Chart 6 is a case of continued secretion presenting a double curve. At the end of the first hour there was a free hydrochloric acid of only 35 acidity per cent., but it continued to rise, until at the end of two hours and thirty minutes it had reached 80. Then there occurred a gradual fall to 65 at the three hour and thirty minute interval, after which there was a rise to 85 in the following forty-five minutes. In the next twenty minutes there was a fall to 70. This case was examined one week later, and showed (Chart 7) a very similar type of curve. It is the only instance of a double curve in the sixty-five cases, and presents a most instructive hypersecretion and hyperacidity. The insufficiency of a single specimen at the end of one hour in this case is obvious.

In a class of cases in which there is a gradual rise of the curves to the end of gastric digestion, it would appear that there was a continued secretion of a juice which, at least, did not decrease in its acidity content but rather increased, thereby producing a fluid increasingly rich in enzyme and acid content.

Which type of curve is normal? From this review and also from Rehfuss, Bergeim and Hawk's[7] study on healthy medical students, there seems to be no type of curve into which all healthy and symptomless cases would fall. Each individual has his type of curve, and there is no means of knowing the type until he has been examined by the fractional method.

Group 3. Stomach Secretions Absent or Delayed: Before the introduction of the fractional method of gastric study there was perhaps no more frequent error in stomach diagnosis than that of achylia gastrica. It will be shown that the removal of the ordinary test breakfast at the end of one hour affords insufficient data for such a diagnosis. By the interval method of examination it was found that this group of cases fell into three distinct classes:

1. Absence of acid and enzymes.
2. Absence of acid, with enzymes present.
3. Enzymes and acid appearing late in the cycle of digestion.

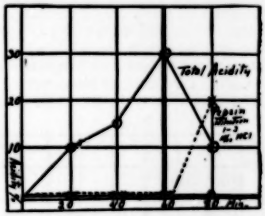


Chart 10.—Mrs. S. C. E.

The absence of acid and enzymes is a relatively unusual finding, and in only two cases out of a total of fifteen was this condition conclusive. Chart 8 represents such a case. This is true achylia gastrica. In addition to an absence of acid and enzymes, there was also a rapid emptying time.

The absence of acid during the entire cycle of digestion with a secretion of enzymes, pepsin and rennin is the more common condition. The enzymes may be present in normal or in decreased amount.

Chart 9 shows the curve of total acidity and pepsin in a case of this type. The enzyme may appear in the early part of the cycle or not until late, as in Chart 10. It is very evident that the case represented in Chart 10 would have been classed as an absence of both acid and enzymes at the end of one hour.

The third class is that in which the acid and enzymes appear late in the cycle of digestion. Three cases have been encountered in this series. Chart 11 presents the curve of a case in which the secretions were delayed for one hour and ten minutes. In the other two cases

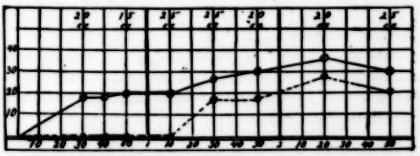


Chart 11.—Mrs. D. A. P.

the free acid as well as the enzymes did not appear until after the first hour. In this type of cases the gastric glands are functionally active but their activity is much delayed. This marked retardation of secretory activity represents the true "chemical" stomach

secretion, the "psychic" secretion being absent. It is obvious that the one hour examination would have placed this class of cases as the true achylias.

SUMMARY

It has been the aim in this review to avoid a consideration of the diagnostic, prognostic and therapeutic possibilities suggested by the various curves presented, but simply to point out, as others have done, the value of interval examination of gastric secretions, and furthermore to emphasize the valuelessness of the ordinary one hour examination. The association of the various types of curves with symptomatology and therapeutic management have been purposely reserved until more extensive clinical data are at hand.

It would seem from an analysis of the fractional study of stomach secretions in this group of cases, that the following conclusions are justifiable:

1. One hour stomach examinations afford insufficient and often misleading information concerning the acidity and enzyme secretion. It gives no evidence of the secretory curve.

2. The fractional method of stomach examination follows the entire cycle of digestion, and supplies reliable information concerning the type of secretory curve, the degree of acidity, the ferment content and an accurate estimation of the emptying time.

3. By fraction study, stomach secretions fall into three groups: (*a*) stomach secretions whose curves fall toward the end of gastric digestion; (*b*) stomach secretions whose curves rise to the end of gastric digestion, and (*c*) stomach secretions delayed or absent.

412 West Sixth Street.

RADICAL OPERATIONS FOR THE CURE OF CANCER OF THE SECOND HALF OF THE LARGE INTESTINE, NOT INCLUDING THE RECTUM *

WILLIAM J. MAYO, M.D.
ROCHESTER, MINN.

The early period of abdominal surgery was concerned chiefly with the question of mortality. With modern methods, it had to be definitely shown that, other things being equal, the opening of the abdominal cavity was comparatively safe. Under the able leadership of Tait in England, who might be called the father of modern abdominal surgery, and Price in America, the mortality was reduced to a point well under 5 per cent., and today standardized and accepted technic has reduced it to about 2 or 3 per cent.

However, the average mortality is somewhat on the increase, owing to the fact, first, that many operations in which there was practically little or no danger, and the results of which served to dilute, so to speak, the mortality of the more necessary operations, are no longer considered advisable, and, second, that modern methods have made possible a successful attack on conditions which were previously considered inoperable and which contributed to the higher death rate.

From the early period in which everything was to be proved by the lowness of the mortality, we learned certain facts, among them, that even by the most careful methods of preoperative examination there is a percentage of error in accurate pathologic diagnosis not far from 10 per cent. This taught us that except in the presence of acute infections or other contraindications, a careful exploration of the abdominal cavity is necessary before operating. It is to be regretted that an accurate pathologic diagnosis cannot always be made; but if we succeed in making a surgical diagnosis and cure the patient, we have, at least, accomplished the main purpose of the operation. It is immaterial to the patient, provided he gets relief, whether that relief comes through the removal of the appendix, gallstones, or an ulcer of the stomach. Moreover, since a diagnosis brought up to the minute by exploration may reveal more than one lesion that can be relieved by a single operation, such exploration should be made unless there are definite contraindications. The patient who has had his appendix removed without an exploration and has been left with a duodenal ulcer or gallstones, the real cause of his symptoms, to be taken care of at a second operation after months of suffering, has justifiable cause for dissatisfaction.

This brings up another important consideration—the disability resulting from the operation itself, which must be reduced to a minimum. If there is more than one pathologic condition which only operation will relieve, the disability will be greatly reduced if the two operations can be done in one stage. If the operations are performed at different times, the multiple risk may be as great at least as that of a single operation. While mortality statistics are reduced one half when the number of operations is doubled, such an apparent reduction, obtained by doubling the number of operations performed on each patient, is misleading, and results only in prolonged disability. The two-stage operation, however, has great merit in a small group of cases in which the desperate condition of the patient justifies any maneuvers that will reduce the operative risk, and in which the question of disability becomes a secondary consideration.

In malignant disease, still another problem, which is worthy of our most earnest attention and is naturally associated with the question of mortality, is operability. Operability today is perhaps the most important consideration in connection with malignant disease. Low operability gives low mortality and high percentage of cures. An examination of the records of resections for malignant disease of the large intestine in our clinic definitely shows that when the disease was confined to the intestine and was movable, the mortality was well under 5 per cent., and the percentage of five-year cures above 60 per cent. Taken by itself, this certainly was a remarkable showing. When the operability was brought up to 62 per cent., the mortality trebled and the percentage of permanent cures markedly decreased, a most unfortunate showing; but when studied in the light of the entire group of cases, we had the paradox that more than twice the number of patients in each hundred were actually cured. This illustrates the fallibility of the view that operative mortality percentages prove correct any theories based on such statistics, and leads others to the trite remark that "Nothing lies like statistics." Statistical percentages of mortality and cure can be studied properly only in their relation to operability. In other words, the greater the number of patients operated on to the hundred examined, the greater the mortality, because it brings in a group of advanced cases in which the risk of operation is great and the percentage of cures small. On the other hand,

* Read before the Section on Obstetrics, Gynecology and Abdominal Surgery at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

it increases by a definite and incontrovertible percentage the number of persons who have actually been cured.

From Jan. 1, 1898, to Dec. 31, 1915, 419 resections of the large intestine have been made in our clinic, with an average mortality of 14.5 per cent. In 184 of these cases, the left half of the colon, including the splenic flexure and not including the rectum, was resected, with an average mortality of 17+ per cent. In resections of the right half of the colon the mortality was 12.5 per cent. The difference of 5.5 per cent. between the two mortality percentages was due to the less septic character of the liquid contents of the right half of the colon as compared with the more solid contents of the left half of the colon, and the greater safety of ileocolostomy as compared with the methods of union following resections of the left colon. One hundred and thirty-one of the resections of the left half of the colon were for malignant disease. Of each hundred patients presenting themselves, sixty-two were subjected to resection. In the remaining thirty-eight the disease was considered inoperable at the time of examination, or proved to be inoperable on abdominal exploration. It is our earnest purpose to increase the operability, first, by endeavoring to secure the cases at an earlier date, and, second, by extending the limits of operability. Increasing experience shows that some of the cases, which at the time of examination we had considered inoperable, may be resected by modern methods with a prospect of permanent cure. In spite of the fact that this extension will add to the list many advanced cases, we should be able notably to reduce the death rate in the whole number by improvements in technic, and at the same time make the operation more radical.

Fig. 1.—*A*, end-to-end tube resection completed; *B*, carcinoma of the pelvic sigmoid. Dotted line indicates the points of resection.

TECHNICAL CONSIDERATIONS

1. An ample working incision should be made in the middle of the left rectus muscle. It is best to ligate the deep epigastric vessel above and below, and to excise the intervening section.

2. A thorough exploration of the involved colon and abdominal cavity, especially of the liver and peritoneal tissues, should be made in order to discover possible metastasis or the direct involvement of other organs which would make a cure impossible.

3. *Mobilization.*—The most important consideration in resecting the large intestine is the detachment of the outer and posterior attachments of the colon so that it may be brought well out of the wound. If we remember that the large intestine has its origin on the left side of the body close to the midline and that it reaches its location around the outer circumference of the abdominal cavity comparatively late, we can readily understand that its outer attachments are in the general nature of holding bands and that they contain no structures of great importance. The splenic flexure is retained in position by the splenocolic ligament, which is derived from the omentum and contains a blood vessel which must be tied. The outer leaf of the mesentery of the pelvic colon in the female is closely associated with the left broad ligament, and here again are vessels which must be ligated.

Posteriorly, the left ureter must always be identified and separated. As a rule, in the operable cases it is possible to detach the ureter safely from the growth; but in several instances we have found it necessary to resect a portion of it, tying the ends with catgut, when it was involved in a situation in which it was impossible to reimplant it in the bladder or suture the ends together. This permanent ureteral obstruction has not been followed by any unfavorable results, and in no case has it been necessary to remove the kidney at a later date because of it. On one occasion close attachments to the left kidney in an otherwise operable case made it necessary to remove the kidney with the growth. The patient has now remained well more than three years. The right ureter should be identified, but will seldom be found involved.

Attachments to the abdominal wall from direct extension of the growth are not infrequent, and we have not hesitated to remove large sections of the involved tissues when necessary. These extensive dis-

sections did not add greatly to the mortality of the operation, and some of the cases in which the growth was so fixed as to be apparently inoperable have been cured.

It has been found wise, therefore, to loosen the colon from its outer attachments and remove all of the involved tissues with it in a single piece. Among the most difficult dissections of this kind are those in which a previous exploration has been made, followed by a fecal fistula, or in which a colostomy has been performed for the relief of the obstruction. Even in these complicated cases, however, all the structures of the abdominal wall on the outer side can be freely dissected if necessary, turning the colon and involved tissue toward the midline. The bleeding vessels are caught and tied, and a large gauze pack placed in the cavity, which is left undisturbed until the operation is completed to check oozing from the cut surfaces.

When the colon containing the growth is drawn well out of the abdomen, it can be lifted up to the light and the blood vessels readily identified and tied. The lymphatic supply of this region is scanty, and herein lies the success of these operations. In 60 per cent. of the fatal cases, according to Butlin, the patients die from obstruction, local infection, etc., before the glands are involved with cancer. Frequently, after extensive dissections, we have examined enlarged glands microscopically, and have found that the adenopathy was the result of sepsis and not of carcinoma. In a number of instances I have resected the colon in patients who had been previously explored and who had been refused radical operation on account of glandular involvement supposed to be carcinomatous. On removal, no cancer was found in the glands.

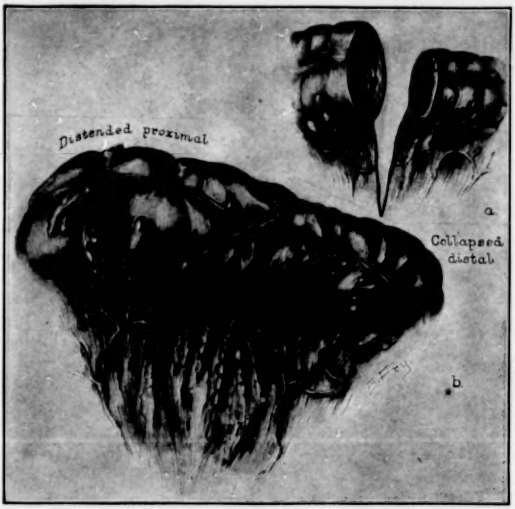


Fig. 2.—*a*, C. H. Mayo method of widening the distal collapsed bowel to meet the distended proximal bowel; *b*, operation completed.

Segregation of the Involved Organs.—Having briefly outlined the character of the task of mobilizing the colon from the outer side, we must take into account the fact that the small intestine frequently becomes adherent to the carcinomatous mass on the inner side and there is direct extension of the disease. As a rule, the extension is to the periphery of the small intestine, although at times it involves the lateral wall of the mesentery. This complication, which we have seen often, by no means renders the condition inoperable, as is so frequently thought. We have several patients who have remained well beyond the five-year limit, in whom from one to three separated loops of small intestine had been resected with end-to-end union, and finally the diseased portion of the colon removed with the attached loops of small intestine. Experience with such resections of the small intestine has demonstrated the fact that almost any reasonable method of anastomosis will be effective — lateral or end-to-end. The general tendency is to take up too much time with these resections and suture more than is either necessary or desirable. Of late we have been more inclined to the end-to-end union with a continuous through-and-through chromic catgut suture, protected by a few interrupted silk sutures in the musculoperitoneal coats.

The ends of the small intestine which are left attached to the colonic tumor are crushed, ligated, and sterilized thoroughly with the cautery to prevent soiling. In low sigmoid tumors, the bladder is not infrequently involved, and on a number of occasions we have removed a considerable portion of its posterior wall. As a rule, only the peritoneal and muscular walls of the bladder are involved, and the mucous membrane is left intact. By the use of chromic catgut sutures protected by a few interrupted sutures of the same character, union seems to be very certain. I have never known a bladder so treated to leak following the operation.

Involvement of the ovaries and tubes and uterus is of small consequence. We have usually made an incision through the peritoneum in front of the cervix, cut the cervix directly across, grasping the uterine vessels and dissecting the broad ligament from below upward on each side, and removed with the uterus the ovaries and tubes, so that the whole mass remains attached to the sigmoid tumor. This is a safe procedure and leaves the adherent uterus to block the point in the bowel weakened by penetration of the tumor, which might otherwise be opened up and flood the operative field with septic contents. The ovaries should always be removed if any involvement is suspected, as they are the most frequent seat of cancer grafting of any organs in the abdominal cavity, probably because each ovulation opens up an unprotected surface for cell grafting.

The appendix is rather frequently adherent to the tumor mass when the cancer lies low, and occasionally the cecum is attached. Removal of the appendix and the necessary amount of the cecum can be rapidly accomplished and does not seem to add greatly to the risk.

Excision of the Involved Colon and Restoration of Colonic Function.—In the manner briefly outlined, the colon and all the involved tissue are delivered outside the abdominal cavity. The further management will depend on how thoroughly we have been able to prepare the patients and whether or not there is obstruction. It has been shown that from one fourth to one third of the stool bulk is due to bacterial growth and that dry stool contains dormant bacteria, while liquid stools have most active organisms. It is undesirable that any attempt be made to evacuate the bowels by means of physic within twenty-four hours before the operation. This should be done at least forty-eight hours before, as liquid contents are difficult to control mechanically, as well as markedly infectious.

Primary resection in the presence of even moderate obstruction is seldom permissible. It is necessary in these cases, first, to relieve the obstruction, as a soggy intestine, edematous and septic, is extremely liable to suture perforation. We must content ourselves either with a cecostomy under local anesthesia, which is best if the obstruction is urgent, a colostomy made as close as possible to the growth so that it can be excised when the resection is performed later, or, still better in the large majority of instances, the two-stage operation of Mikulicz and Bruns (Figs. 1 and 2).

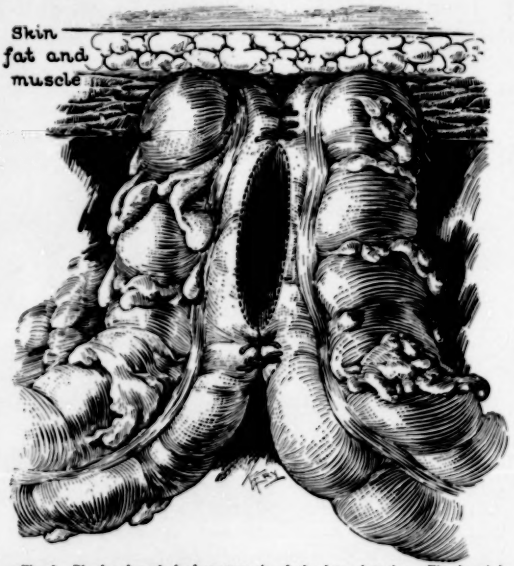


Fig. 3.—Bloodgood method of anastomosis of the large intestine. The bowel is attached to the incision in such a way that, should leakage occur, it would readily find its way to the surface.

Many patients will come with obstruction of the bowels and in extremely poor condition for operation. At times by lavage of the stomach and maintaining the fluids of the body if necessary by subcutaneous salines, such patients can be carried over the acute attack and subjected to operation later after flatus and bowel movement has been secured.

When conditions are favorable for a primary resection with an end-to-end anastomosis, the use of the sigmoid tube (Fig. 1 *a*), that is, a rubber tube of considerable caliber, which, as advised by Balfour, is passed from the anus completely through the anastomosed area and some inches above, will reduce the death rate to a very great extent. We frequently pass these tubes well up into the splenic flexure. A large-sized, rather firm stomach tube with a few lateral eyes near the tip will answer the purpose (Fig. 1 *b*).

The sutured area should be attached to the peritoneum if there is any doubt whatever as to the integrity of the suture line, or it may be brought completely through the peritoneum, the latter being attached behind it so that it lies within full view, and any leakage will be to the surface. If the colon is too short for this maneuver, the sutured area may be suspended on a roll of rubber tissue so that it will develop adhesions and the suture line will become extraperitoneal.

In applying the end-to-end suture, there is an unconscious tendency to draw the sutures tight, so as to narrow the lumen. This can be easily overcome, as suggested by C. H. Mayo (Fig. 2), by making an incision along the free surface of the colon opposite the mesenteric attachments three-fourths inch deep on each side, and trimming off the corners. When the suture is complete, the lumen is widened to that extent at the point of anastomosis. The Bloodgood method of colonic anastomosis also serves an excellent purpose. A drawing of this method is here shown and is so plain that it needs no further description (Fig. 3). The tube method of end-to-end anastomosis described by Balfour is especially valuable following resections of low sigmoid growths.

About twelve years ago, C. H. Mayo introduced into the clinic the Mikulicz-Bruns method (Fig. 4) of resecting the second half of the colon, and this method has probably done more to extend operability and reduce mortality than any other factor. It consists in loosening up the diseased portion of the colon, as already described, separating the mesentery, and lifting the growth and glands with the involved tissues entirely out of the abdomen. The sound colon for several inches above and below is well cleared and the two arms sutured, the tumor and a sufficient quantity of intestine being left completely outside the abdominal cavity. The peritoneum is sutured around the base of the extruded mass so that it becomes entirely extraperitoneal and is allowed to heal into the incision. In from three to seven days the mass is cut off, the two ends of the intestine being left like a double-barreled shotgun in the wound. If there is obstruction, the method of Paul is advisable, that is, after the sigmoid is fixed firmly in the wound to prevent retraction within the abdomen during sudden strain (coughing, etc.), the tumor mass is cut away, leaving the ends of the sigmoid projecting an inch or more. A rubber tube, 1 inch in diameter, is fastened into the proximal bowel end to carry the obstructed contents into a container. In many cases in which the circu-

lation in the extruded loop is cut off, it is good practice to cut the tumor away at once after tying and sterilizing the ends of the bowel, as advised by Peck. This prevents soiling for from twenty-four to forty-eight hours until the wound is protected, and if the patient has been well prepared the temporary obstruction is borne without difficulty.

At a second stage, about ten or twelve days after the primary operation, during which time the bowels have been thoroughly evacuated, one blade of a 4-inch clamp is placed in each opening of the colon and the clamp closed to the first notch. Each day it is tightened until, at the end of about six days, it has cut its way through, converting the outer end of the double lumen of the intestine into a single cavity. A few days later the resulting colostomy can be closed by a simple extraperitoneal operation. It might be thought that with better technic a larger percentage of these cases could be subjected to immediate resection, but it is not technical faults in suturing that lead to disaster. If leakage occurs, it is usually in the second week, owing to perforations in the suture line after the sutures have fulfilled their mission. We have found chromic catgut for gastro-intestinal suture less liable to this complication than silk or linen.

The operation of Mikulicz can be applied to very low growths. It is astonishing to what extent even the upper part of the rectum can be brought into the abdominal wound. On many occasions we have removed rectosigmoid growths in this way, separating the rectum within an inch of the anus, and by loosening and depressing the parietal peritoneum, have succeeded in maintaining the growth exterior to the abdominal cavity. Often it is necessary to pack gauze about the protruding mass to support it in the wound beyond the peritoneum. The gauze support should be left from ten to sixteen days. In very fleshy patients in whom it has been practically impossible to bring the growth to the surface, we have in this manner brought the involved bowel up just outside the peritoneal cavity, and left it in the deep wound with an iodoform gauze support as long as eighteen days. When the tumor is finally cut away, the anastomosis will often complete itself without any secondary operation.

Occasionally, abscess cavities of considerable size will be found in the pelvis. These by no means necessarily indicate that the growth is inoperable, but they require the complete closure of the pelvis following the operation by loosening up and attaching the peritoneum so as to protect the abdominal cavity, and in the female by draining through the vagina. In the male, the entire small pelvis must be packed with iodoform gauze. These abscesses are more often found in the female than in the male, possibly because of the proximity of the fallopian tubes.

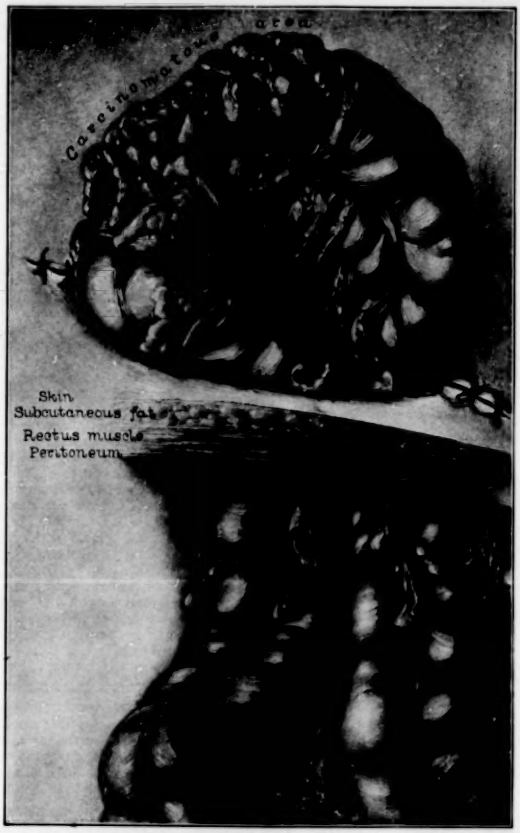


Fig. 4.—First stage of Mikulicz operation completed. The tumor, involved part of bowel, fat and mesentery being drawn outside the abdominal wall, where it will remain until it heals in. It will then be cut away, and the partition between the limbs of the bowel, as sutured together, will be cut out with forceps, restoring the lumen, and the colostomy closed.

At times it is better to terminate these extensive complicated operations for rectosigmoid cancer by a permanent colostomy above, applying a right-angled clamp across the rectum below the growth and sterilizing the stump with the actual cautery. The necessary amount of involved sigmoid is then cut away and the proximal end brought out of the median incision just below the umbilicus as a permanent colostomy, after the method of Mixter. The cavity of the pelvis about the clamps is packed with iodoform gauze. The clamps are removed at the end of a week, and the gauze, the latter part of the second week. As a rule, it will be best to fasten the peritoneum at the brim of the pelvis to the sigmoid.

To one who has not actually taken part in some of these formidable operations, they might appear impossible, or even if mechanically possible, to be fraught

with so much immediate danger and so little chance of permanent cure as not to be justifiable. This is by no means true, however, for after such extensive and complicated dissections we have had a very considerable percentage of permanent cures, and in the cases in which the disease has returned, the patient has had a long respite of comfortable existence which could not have been obtained by a palliative colostomy.

There were 262 resections of the large intestine for malignancy. Of the patients who recovered and who were operated on more than five years ago, 54 per cent. are alive. Of those operated on more than three years ago, 67.5 per cent. are alive.

In conclusion, I would urge that patients with cancer of the second half of the colon be given a chance even under unfavorable conditions, because the nature of the disease is such that the prospects of cure are better than for cancer in any other situation in the body, except on the lip and in the fundus of the uterus.

ABSTRACT OF DISCUSSION

Dr. Edward Martin, Philadelphia: The interpretation on the part of the individual while absolutely honest is not largely convincing to other than himself. The surgery of ptosis is largely obscured as to its ultimate results by the personal equation of the operator and by the impressionable psychology of those exhibiting the symptom complex of this condition. But, when it comes to cancer there is a local condition amenable only to surgery and which is either cured or is not cured by it. The test of cure is freedom from recurrence and this paper giving us such a test stands as the most notable and authoritative communication on this subject. Not the least important part of the teaching is the recital of results on taking any operative risks in so far as immediate survival is concerned, rather than being content with a partial operation or a palliative procedure. Indeed, if there be no hope of radical cure, an operative death is not to be regretted. So far as discussion of this paper is concerned, the Mayos and the Mayo Clinic are the jury before whom we lay our surgical problems, nor has any surgeon had cause to question the wisdom of their findings.

Dr. Jerome Morley Lynch, New York: As Dr. Mayo has said, only those who see these cases and operate frequently can appreciate the number of people who are condemned to death simply because when a diagnosis of cancer is made they stop there and no effort is made to cure these victims. I wish Dr. Mayo could go before every medical society in the country and state the fact that a great many cases considered inoperable are in reality operable. I recall a number of such cases both in my own practice and that of the late Dr. Tuttle. The sudden onset of constipation, to my mind, is the most important symptom in connection with cancer of the colon. It is the general practitioner, and not the surgeon, who sees these cases first, and he should be alive to the possible diagnosis of cancer. I have found it almost impossible in some cases to clean the colon previous to operation by any method of catharsis. I recall a case of constipation in which I operated for cancer. The man returned about three years later. He had been until that time absolutely regular and then became constipated. I found that he had a nodule not as big as a pencil which proved to be an adenocarcinoma, and the patient is alive today, proving that cancer of the colon is not always fatal. Glandular enlargement is no contraindication to radical removal. Kocher's statistics support this. Many cases in which he had occasion to operate a second time were due to the accompanying infection rather than to the cancer. If compatible with life, therefore, I advocate the widest possible removal. I agree absolutely with the essayist regarding operative results, and think too great emphasis cannot be placed on the necessity of exploring every case of cancer of the sigmoid colon, however inoperable the case might at first sight appear. The sudden onset of constipation characteristic of colonic cancer can be explained on biologic grounds. Dr. Draper and I have been impressed with the difficulty of emptying the colon previous to operation, regardless of the position of the new growth or the involvement of the lumen. Lateral implantation with no encroachment of the lumen has offered no exception. I have noted impaction following recurrences in a patient whose bowels had been previously regular. This recurrence was no larger than a pea. Until a better working hypothesis is offered this phenomenon should be looked on as a protective mechanism of the host due perhaps to an enzyme from the cancer.

Dr. R. C. Coffey, Portland, Ore.: Like Dr. Martin, we think no further than the Mayo Clinic when it comes to a discussion of cancer of the colon. A word might be said, however, of the work of John Young Brown of St. Louis who does ileostomy under a local anesthetic with no danger to the patient. Far advanced cases are only partially relieved. With the use of a bag and cup, however, the patient can go around with perfect comfort. The importance of Dr. Brown's work has not been appreciated. It is certainly far superior to having a colonic fistula and gives much more convenience to the patient.

Dr. John W. Draper, New York: This section ought to go on record as subscribing to the statement Dr. Mayo made, that you could tie the ureter anywhere in its course and never have any trouble from that kidney. We have done it on animals upward of fifty times and then watched for the result on the occluded kidney, but there is no result. Just as certainly as the negative renal pressure which is a necessary part of urinary secretion ceases, becomes positive, all secretion stops and you cannot produce hypernephrosis by tying a ligature tight. The only way to produce it is by intermittent partial obstruction. Complete obstruction is safe. Partial obstruction is not safe.

Dr. Julius H. Jacobson, Toledo, Ohio: I desire to emphasize the point Dr. Mayo makes, that in the presence of obstruction no radical resection operation should be made. The Mickulicz three-stage operation is a method which will accomplish much in reducing primary mortality in these desperate intestinal cases. The only objection which I find to the method is that the anastomosis when finally completed remains attached to the abdominal wall. This, however, seems to be no disadvantage on account of the larger lumen at the anastomatic site. It is a method which should be practiced more frequently, particularly in obstructions about the sigmoid portion of the descending colon.

Dr. W. J. Mayo, Rochester, Minn.: Regarding ligation of the ureter, referred to by Dr. Draper, of course, in a diseased kidney this might make trouble, but in such a case one would know something of the condition; and such a kidney could be removed, as was suggested in the course of the paper. In pelvic operations I believe that a great many times without knowing it the ureter is tied and there is nothing to show for it but a quickening of the pulse for a few days.

A Nation of Wasters.—A conservative estimate of the annual number of accidents in the United States which result fatally, or in partial or total incapacity on the part of the worker, has been placed by workers in this field at 500,000, representing an economic loss of $250,000,000 a year. The suffering involved and the hardship inflicted on the families of the injured workmen cannot be estimated in terms of dollars and cents. We have acquired a reputation as a nation of wasters. It is apparent that whenever a life is lost or a workman incapacitated the cost of maintenance of the remainder of the population is thereby increased. We would do well in "conserving our national resources" to place the conservation of the life and limb of the workingman at the head of the list. It is evident that we are becoming aroused to the need for an effective means to check this enormous economic waste. The nation-wide movement toward safety, toward accident prevention, and toward the elimination of the hazards of life is a mighty protest against this destruction which is taking place daily. That half the accidents in the United States are preventable is the general opinion of the engineering profession.—W. A. Bloedorn.

THE CORPUS LUTEUM

ITS LIFE CYCLE AND ITS RÔLE IN MENSTRUAL DISORDERS *

EMIL NOVAK, A.B., M.D.
Fellow of the American College of Surgeons
BALTIMORE

Since the publication of Fraenkel's paper,[1] in 1903, the study of the corpus luteum has been the point of departure in most of the investigations which have been made as to the cause and mechanism of menstruation. I shall not review the now voluminous literature of this subject, except perhaps to call attention to the definite advance made in 1911 by Robert Meyer,[2] who showed that the corpus luteum, like the endometrium, passes through certain stages corresponding to the various phases of the menstrual cycle.

The purpose of this present paper, aside from the study of the normal life cycle of the corpus luteum in relation to the menstrual cycle, includes an effort to determine whether any histologic variations in the lutein structures of the ovary can be found to explain the various menstrual disorders. Only the salient points of the inquiry can be sketched within the brief limits of this paper, leaving the more extended discussion of the various aspects of the subject for a more exhaustive report to be published later. My investigation so far has embraced the clinical and histologic study of 137 cases from the Gynecological Department of the Johns Hopkins Hospital. While these cases constitute the actual basis for the present paper, I have had the opportunity of studying a large number of corpora lutea from cases not included in the series.

In 102 of the 137 cases of the series studied, both ovaries had been removed, together with the uterus, so that it was possible to study the histologic picture of the endometrium side by side with the histologic variations in the removed ovaries. The latter were thoroughly ransacked, by numerous sections, for all traces of lutein tissue, as well as other characteristic structures which might be of functional importance. A careful study was thus made, not only of corpora lutea in various stages of development, but also of other structures, such as mature graafian follicles, atresic follicles, etc. In this way it would seem that the possibility of overlooking structures of functional importance could be reduced to a minimum, since the presence of such elements can usually be easily determined macroscopically. This is especially true, of course, of the yellow-walled corpus luteum in all except perhaps its earliest stages. Only by such thorough examination of both ovaries are any generalizations justified as to the significance of its various elements.

The mere presence or absence of corpora lutea on the surface of the ovary means very little. It is common to find well developed corpora lutea in ovaries which on their surface give little or no indication of their presence. For this reason, observations made during operations on ovaries which are not removed are far less valuable than the thorough examination of the ovaries after removal. As a matter of fact, the only indication of the site of even large corpora lutea is apt to be a slight hemorrhagic discoloration on the surface. Only by cutting into the ovarian substance is the true nature of the otherwise easily overlooked area revealed.

Again, since corpora lutea may be present in both ovaries, it is obvious that it would be hazardous to venture any very sweeping deductions unless both ovaries are studied. It is for these reasons that I have selected for this study chiefly those cases in which both ovaries had been removed. The essential importance of accurate menstrual histories in such an investigation is obvious, as well as a knowledge of the full pathologic findings at operation and in the laboratory.

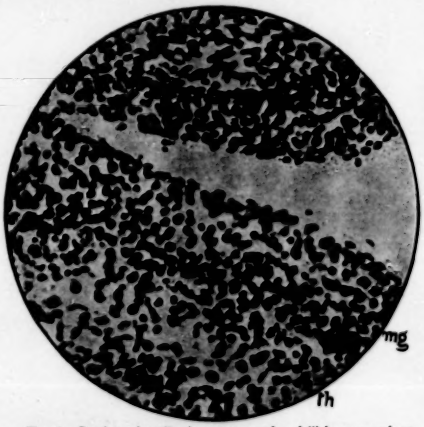


Fig. 1.—Portion of wall of mature graafian follicle, removed on fifth day of cycle (high power): *mg*, membrana granulosa; *th*, theca interna. All photomicrographs by Schapiro.

In a second smaller group of cases, numbering thirty-five, all ovarian tissue had not been removed at operation. Deductions from these cases cannot be included in any generalization concerning the rôle of lutein tissue in either normal or abnormal menstruation. They have been included in the study because the ovarian tissue removed from them has contained lutein structures which in one way or another are of interest from the standpoint of this investigation.

A careful study of the ovaries included in my material has enabled me to secure corpora lutea in practically all stages of development. One may thus trace the life history in a consecutive manner from beginning to end. Only in this way can an intelligent conception be gained as to the origin, development and ultimate fate of the structure derived from the rupture of the ripe graafian follicle.

With a few exceptions, those who have studied the corpus luteum in the past have seemed to disregard the fact that, like the endometrium, it undergoes a change from day to day. The stereotyped conception of the corpus luteum seems to have been that of a large structure, with brilliant yellow undulating walls, standing out sharply from the cut surface of the ovary. While this description fits the corpus luteum in certain stages of its development, it is altogether incorrect as

* From the Gynecological Department of the Johns Hopkins Medical School.
* Read before the Section on Obstetrics, Gynecology and Abdominal Surgery at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.
* Because of lack of space this article is abbreviated in THE JOURNAL. The complete article appears in the Transactions of the Section and in the author's reprints. A copy of the latter will be sent by the author on receipt of stamped addressed envelope.

1. Fraenkel, L.: Arch. f. Gynäk., 1903, lxviii, 438.
2. Meyer, Robert: Arch. f. Gynäk., 1911, xciii, 354.

applied to others. The above mentioned characteristics are apt to be those of the fully developed corpus luteum, which has, however, reached this stage only after a process of gradual development extending over many days. The presence of the large yellow walled corpus luteum does not, therefore, signify that ovulation has occurred just previously, as so many have assumed in discussing the subject.

In its earliest stages, just after rupture of the graafian follicle, the corpus luteum is usually a small, collapsed structure, with thin, moderately undulating walls, which are of grayish yellow hue instead of the brilliant yellow color of the later stages. For this reason the earliest stages are very inconspicuous and are usually overlooked. Indeed, their discovery, even with careful search, must be looked on as in large measure accidental. The difficulty of securing these early stages is increased by the uncertainty as to the exact time of ovulation, so that it is not possible, in the present stage of our knowledge, to arrange operations of election with a view of obtaining these early corpora lutea. Again, there is much evidence that the changes in the early history of the corpus luteum take place very rapidly, so that the earliest stages, speaking histologically, extend over a comparatively short time.

It is not surprising, therefore, that there have been very few observations in the human being on the earliest stages of the corpus luteum. Indeed, I know of no such observation, with the exception of the questionable one of Kreis[3] in 1899, until the report of Meyer's series of cases in 1911. And yet the study of the corpus luteum in its earliest stages throws a light otherwise unobtainable on such important questions as that of the origin of the lutein cells—the still open question as to whether they arise from the epithelial cells of the membrana granulosa or from the connective tissue cells of the theca interna. For this reason I have been especially on the alert in the investigation of my material for these early stages of corpus luteum development, and have been rewarded by finding five interesting examples. On account of the rarity with which such cases have been described, I shall refer briefly to the findings in these five cases.

Fig. 2.—Portion of wall of early corpus luteum, removed on tenth day of cycle (low power); *mg*, membrana granulosa; *th*, theca interna. Note the vascular line of demarcation between these two layers.

CASE 1 (private patient).—Mrs. L. M., aged 28, was operated on by me at Mercy Hospital, March 2, 1916, the operation consisting of left salpingo-oophorectomy, appendectomy and resection of the right ovary. Menstruation had always been regular, lasting five days and being moderate in amount. The last period before operation commenced February 21, lasting five days, so that operation was done on the tenth day of the menstrual cycle.

Careful examination of the left ovary afterward failed to reveal any lutein structures. It contained, however, a follicular cyst about the size of a walnut, and numerous smaller cysts. The wedge of right ovary which had been removed, however, presented a small dark reddish discoloration on the surface. On section this was found to mark the site of a scalloped cavity, a little over 1 cm. in diameter, which contained no blood, the hemorrhagic appearance of the surface being apparently due to the excessive hyperemia of the walls. At one point there was a small eroded spot representing the point of rupture.

Microscopic sections revealed a picture which I had heretofore not observed, and which is well shown in Figures 2 and 3. The membrana granulosa is not only present, but there is not the slightest indication of degeneration. The cells are still quite compact, resembling those of the mature graafian follicle, except that they are more cylindric (compare Figure 1). The most remarkable change is evident in the cells of the theca interna. These have become large, epithelioid, and infiltrated with fat. The theca interna has become very vascular, its blood vessels, derived from the theca externa, pushing centripetally toward the granulosa, which, however, is not yet invaded. Especially striking is the vascular line of demarcation which has formed between the granulosa and the theca.

CASE 2 (Gyn. Path. No. 21216).—The patient was a white woman of 46, on whom a radical operation for cancer of the cervix was done in Dr. Kelly's service, May 19, 1915. Menstruation was irregular on account of the carcinoma, a bloody discharge having been present for eight months. Both ovaries were small and cirrhotic. The surface of the right ovary showed a small hemorrhagic discoloration, beneath which was found a cavity with scalloped walls, measuring about 1 by 2 cm. The cavity itself contained no blood, but there was much hemorrhagic infiltration of its wall in places, especially near the surface. The microscopic picture was almost identical with that shown in Figure 1. The endometrium was of the interval type.

CASE 3 (Gyn. Path. No. 21223).—This patient, a white woman of 38, was operated on in Dr. Kelly's service, May 24, 1915, for the radical removal of a carcinoma of the cervix. Preliminary cauterization was done, May 15, 1915. The last menstruation had begun May 2, although the intervening operation and the presence of the cancerous disease detract from the importance of the menstrual history. The right ovary contained an early corpus luteum similar to those in Cases 1 and 2. There was in this case, however, a very great hemorrhagic extravasation surrounding the wall of the corpus, in many places obscuring the cells of the theca. The endometrium was of the interval type.

CASE 4 (Gyn. Path. No. 21195).—A white woman, aged 34, was operated on in Dr. Kelly's service, May 13, 1915, for chronic pelvic inflammatory disease, with left tubo-ovarian abscess. Panhysterectomy, with double salpingo-oophorectomy, was performed. Irregular bleeding had been present for two months. The right ovary contained a small cavity, a microscopic section of which is pictured in Figure 4. The same ovary contained a large corpus luteum in the stage of retrogression. The endometrium was of the interval type. The corpus luteum pictured in Figure 4 differs from that represented in Figures 2 and 3 in that the granulosa cells are losing their long cylindric shape and are becoming larger

3. Kreis, O.: Arch. f. Gynäk., 1899, lviii, 426.

and more polygonal. In other words, they are beginning to assume the morphologic characteristics of lutein cells. On the other hand, the theca cells are much less conspicuous than in the earlier stage, having lost much of their fatty content.

CASE 5 (Gyn. Path. No. 21333).—This patient was a colored woman, aged 43, who was operated on in Dr. Kelly's service, July 6. The operation was hysterectomy with double salpingo-oophorectomy, on account of extensive inflammatory disease with cystic degeneration of both ovaries. Menstruation had always been regular, lasting two or three days, with moderate flow. The date of the last menstruation was June 20, so that the operation was done on the sixteenth day of the menstrual cycle. In the right ovary was a blood-filled cavity measuring 3.5 by 1.5 cm. which proved to be a corpus luteum cyst. Between this and the surface of the ovary, just beneath the latter, was a rather flattened cavity which on microscopic examination was found to be an early corpus luteum, similar to that found in the preceding case.

The five specimens of early corpus luteum here reported are alike in the very important particular that in all of them the epithelial cells of the granulosa are, to say the least, quite intact. This fact is of prime importance in the consideration of the origin of the lutein cells. One of the strongest arguments against the epithelial origin of these cells has been the alleged degeneration and disappearance of the membrana granulosa after rupture of the follicle. In each of my five specimens, however, the epithelium is well preserved. Moreover, in Cases 4 and 5, it exhibits definite signs of a lutein-like transformation. This I look on as a vital point — *the* vital point — in connection with the question of the origin of the lutein cell. If we can demonstrate in human beings, as Sobotta[4] seems to have shown in lower animals, that there is a direct transformation of the granulosa cell into the lutein cell, the problem is solved. I believe that Figures 1, 2, 3 and 4 illustrate such a beginning transition of the granulosa cell to the lutein cell. It will be noted that this transformation is already well under way before there is any evidence of vascular invasion of the granulosa layer, and that as the granulosa cells assume lutein characteristics, the cells of the theca become less conspicuous, giving up much of their fatty content. This may be observed from a comparison of Figures 3 and 4. From this it might be inferred that the theca cells, with their rich fatty content, fulfil an important nutritive function, as Meyer has suggested. The gradual retrogression of the theca cells, moreover, is another indication that it is not they that are to be transformed into lutein cells.

That the structures which I have described are really corpora lutea and not merely mature and unruptured follicles is evidenced, not only by the demonstration of a definite point of rupture in at least two of the cases, but also by the many layers of the epithelium, by the cylindric shape and large size of the cells, by the striking fatty deposit in the theca interna, and by the pronounced and characteristic hyperemia (Compare Figures 1 and 3).

Fig. 3.—High power picture of corpus luteum shown in Figure 2. Compare with Figure 1.

As to the time relation of these early corpora lutea to the menstrual cycle, only two of the five cases, unfortunately, can give any trustworthy evidence, owing to the irregular bleeding present in the others. The structure found in Case 1 and pictured in Figure 2 was obtained on the tenth day of the menstrual cycle. For the absolute accuracy of the menstrual history in the case I can vouch. In Case 5, on the other hand, the patient was operated on on the sixteenth day of the menstrual cycle, although histologically it represents only a slightly later stage than that seen in Case 1. Meyer's earliest corpus luteum was found on the twelfth day of the cycle. The unruptured follicle pictured in Figure 1 was removed on the fifth day of the cycle. It would be indiscreet to draw from this small group of cases any conclusions as to the time of follicular rupture. Indeed, it does not seem to me that a sufficient number of cases have as yet been studied by all investigators collectively to warrant any such generalization. I may simply state that in the five cases reported by me ovulation seems definitely to have occurred in the first half, or perhaps we may say the second quarter, of the intermenstrual period, and that the time of follicular rupture is subject to a certain — perhaps a considerable — degree of individual variation.

The later stages of the development of the corpus luteum I shall pass over much more briefly, as my observations differ in no important respect from those of Meyer. In the five cases above described, there was no evidence of invasion of the epithelium by the blood vessels of the theca. Figure 5, which pictures a corpus luteum removed on the fourteenth day of the menstrual cycle, shows a somewhat later stage. The granulosa cells are large and epithelioid, and contain some fat. In other words, they now possess all the morphologic characteristics of lutein cells. The lutein zone is still rather narrow and only slightly undulating.

The most significant feature of this stage, however, is the invasion of the lutein layer by small blood channels. These are clearly traceable back to the ring of blood vessels which marks the division between the granulosa and the theca, as described in connection with the earlier stages. Some of the blood in the lutein zone is present in definite endothelium-lined vessels, while some lies free between the cells, making its way to and into the cavity of the corpus. Even in this early stage, endothelial cells may be observed here and there to push out into the lumen, forecasting the organization of the blood contents which takes place in the late stages of the corpus luteum. It will also be seen

4. Sobotta, J.: Arch. f. mikrosk. Anat., 1896, xlvii, 261.

that vascularization of the lutein layer is chiefly responsible for the bleeding into the cavity of the corpus, and for the organization of the lumen contents. From a physiologic point of view, it is of great importance because, in addition to carrying nutriment to the lutein cells, it enables their secretion to be emptied directly into the blood stream. Together with the advance in the development of the lutein cells, there is a corresponding retrogression in the theca cells. They have lost most of their fat, and are apparently reverting to the type of ordinary connective tissue cells.

In Figure 6, which represents a considerably later stage, the theca cells are inconspicuous, while the lutein layer appears as a broad festooned zone irrigated by numerous blood channels. The corpus luteum in this picture is rapidly approaching the stage of maturity, which is illustrated in Figure 7. Here one sees the corpus luteum in full bloom. Operation in this case had been done on the twenty-seventh day of the menstrual cycle. The lutein cells are large and polygonal, and give every histologic appearance of active function. Toward the lumen they are separated from the contents by a delicate layer of organized tissue, whose formation from the septa penetrating the lutein layer from the theca is clearly traceable. Meyer attaches great physiologic importance to this layer, as indicating that the secretion of the lutein cells can no longer be given off into the lumen, but must pass back into the blood stream. In many mature corpora lutea which I have examined, however, this layer is very poorly marked, and I believe that irrigation of the lutein zone by the vascular channels is more important than the formation of this organized layer in determining the internal secretory function of the corpus luteum.

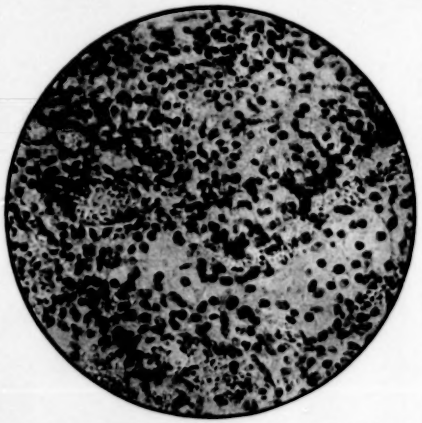


Fig. 4.—Wall of early corpus luteum, slightly more advanced than that shown in Figure 3 (high power). Note the lutein-like change of granulosa cells, and beginning retrogression of theca cells.

The present series included twenty-four corpora lutea classified histologically as mature. Reference to the menstrual histories in these cases showed that operation had been done at periods varying from the eighteenth to the twenty-seventh days of the cycle. In other words, the mature corpus luteum is found during that portion of the cycle in which the endometrium exhibits the premenstrual hypertrophy.

An exceedingly interesting feature of many corpora lutea, especially near the stage of maturity, is the remarkable development of the theca interna cells. This is well shown in Figure 7, and, more highly magnified, in Figure 8. The theca cells are seen to be fully as well developed as are the lutein cells, though they are of quite a different type. The contrast is very striking. The large size of the theca cells, their alveolar arrangement, the richness of their blood supply, all suggest a glandular structure and function. I cannot believe, as does Meyer, that the theca cells, after fulfilling a nutritive function in the earliest stages of the corpus luteum, retrogress and serve no further purpose. The name of "paralutein" cells was given to these cells by Pinto,[5] who, however, credits them with no special function. Such pictures as that shown in Figure 8 speak strongly against such a view. The corpus luteum pictured in Figure 9 shows a similar theca change occurring with an early tubal pregnancy. Incidentally it illustrates also the broader lutein zone and the more advanced organization of the corpus luteum of pregnancy. The theca changes represented in Figures 7 and 9 are practically the same, though one patient was pregnant and the other was not.

There can be little doubt that the corpus luteum possesses at least a dual function. Even Fraenkel attributed to it not only the causation of menstruation but also the fixation of the ovum in the early part of pregnancy. Since the luetin cells proper are almost certainly concerned in the causation of the menstrual phenomena, perhaps the paralutein cells are in some way concerned in the other important function ascribed to the corpus luteum. This, however, is a problem of biologic chemistry. I may simply state that in nineteen corpora lutea exhibiting marked development of these paralutein cells, all except a few were removed from patients who gave histories of profuse and, in a few instances, irregular menstruation. It is curious to note, also, that many of the patients were sterile. In some cases pregnancy had never occurred although the patient had been married many years, while in others, again, there had been a long period of secondary sterility.

ORIGIN OF THE LUTEIN CELLS

Such a complex question as this cannot, of course, be adequately discussed in the limits of the present paper. I shall merely indicate one or two facts which the study of my cases has brought out and which seem to throw light on this problem. The theory of the connective tissue origin of the lutein cells was supported by von Baer, the discoverer of the human ovum, and, after him, by His, von Kölliker, Spiegelberg, Paladino, Schottländer, Clark, Holzl, Nagel and others. On the other hand, the theory of the epithelial genesis of the lutein cells has found able supporters in Bischoff, Pflüger, Call and Exner, Schulin, Waldeyer, Sobotta and others. The latter theory, moreover, is favored by most of the modern German school of investigators who have contributed so much to our knowledge of the corpus luteum.

The question of the origin of the lutein cells in the lower animals has been conclusively settled by the exhaustive studies of Sobotta[4] on mice, rabbits, guinea-pigs and other mammals. Sobotta's studies indicate that in the lower animals, at least, it is from the epi-

5. Pinto, C.: Ann. di obstet. e ginec., 1905 (quoted by Seitz, Footnote 6).

thelial cells of the membrana granulosa that the lutein cells are derived. It is questionable, however, whether these findings may be taken as applying to the human corpus luteum, especially since there has been such a paucity of accurate studies of the human structures.

Without going into the evidence pro and con, I may say that the balance was thrown decidedly in favor of the epithelial origin of the lutein cells by the studies of Robert Meyer on very early stages of corpus luteum development, as already mentioned. The early corpora lutea described by me in this paper fully confirm Meyer's claim that the cells of the membrana granulosa do not undergo degeneration after follicular rupture. Furthermore, the "paralutein" cells found in many corpora lutea, constituting a distinct zone between the lutein layer within and the theca externa to the outer side, are, with scarcely a doubt, developed from the theca interna. If this be true, there is no reasonable doubt of the origin of the lutein cells from the epithelium of the membrana granulosa.

Finally, the demonstration, as seen in Figures 1, 2, 3, 4 and 5, of a direct transformation of the granulosa cells into, first, lutein-like cells and then into actual lutein cells, is the strongest and most direct histologic evidence that can be brought to bear on this question. The great desideratum at the present time is the secural of many more early corpora lutea, so that all possible stages may be described in the actual conversion of granulosa cells into lutein cells. Such evidence is infinitely more valuable than any that can be obtained from the study of the mature corpus luteum.

Fig. 5.—Wall of corpus luteum in stage of early vascularization, sixteenth day (high power). Blood vessels from the theca are pushing into the granulosa layer (*l*), which now possesses definite lutein characteristics. The theca cells (*th*) have lost their fat and are retrogressing. Note the beginning invasion of the blood in the cavity (*c*) by endothelial cells.

ATRESIA FOLLICULI AND THE THECA LUTEIN CELLS

Only a very small percentage of the follicles in the ovary attain maturity, with the discharge of their ova and the development of corpora lutea. The great number sooner or later exhibit the phenomenon of atresia, which is characterized by degeneration of the ovum and of the epithelial cells of the granulosa. I shall not here discuss the influence which brings about this arrest in the development of the follicles, except to say that it seems to emanate from the discharged ovum. The cystlike cavities resulting from atresia are found in practically all ovaries during the reproductive period, and not infrequently even in the ovaries of fetuses and young children. When present in excessive number, they give rise to the well known fibrocystic disease of the ovary. The later history of the cystic atresic follicle is a gradual process of obliteration. In other words, the two varieties of atresia folliculi described by Seitz,[6] the cystic and obliterative, are in reality only different stages of the same process.

The theca cells of the atresic follicle, as is well known, exhibit a striking change during pregnancy, giving rise to the so-called "interstitial glands." Although no special attention seems to have been paid to their behavior in the nonpregnant condition, the arrangement of these cells strongly suggests that these cells possess some sort of function. What the relation of the theca lutein cell is to the paralutein cell already described I do not believe can be stated in the present stage of our knowledge.

As to the clinical significance of atresia folliculi, we may look on the process as, within certain limits, physiologic. On the other hand, the so-called fibrocystic ovary, to which so much pathologic importance was attached in the past, represents usually a marked exaggeration in the number and size of the atresic follicles. The particular point which struck me in going over my cases was that the ovaries which exhibited extreme degrees of follicular atresia, i. e., the fibrocystic ovaries, were almost always associated with excessive menstruation. I hasten to add that I do not look on the fibrocystic disease as the cause of the excessive menstruation. I do believe, however, that, like the latter, it is an evidence of excessive ovarian function. The majority of these ovaries are found in association with pelvic inflammatory disease, which brings about a greater or less increase in the blood supply of the ovary with hyperfunction as the natural result. Another result of the ovarian hyperemia is a stimulation of the growth of the follicles throughout the ovary. Only one of these each month, as a rule, comes to rupture, the others forming the numerous cavities of varying size, with or without epithelium, scattered throughout the ovary. If this view is correct, the presence of the fibrocystic ovary is an important index of ovarian hyperemia and hyperfunction, with excessive menstruation as the most frequent clinical symptom. This would explain, moreover, the frequent good results obtained by resection of a greater or less amount of ovarian tissue in cases of this type.

CLINICAL CONSIDERATIONS

One of the purposes of this study has been to determine whether any characteristic anatomic changes in the ovaries, especially as regards lutein tissue, are associated with the various disorders of menstruation. The histologic appearance of a tissue cannot be taken as an index of its functional activity. It would be of value, however, to know whether amenorrhea on the one hand or excessive menstruation on the other are associated with differences in the lutein cell content of the ovary, as one would expect might be the case.

One of the most important methods of studying the function of an organ is to study the results of its

6. Seitz, L.: Arch. f. Gynäk., 1906, lxxvii, 203.

removal. I need only mention the valuable results yielded by this method of study in the case of other endocrine glands, such as the thyroid, parathyroid, suprarenal or pituitary. Fraenkel's plan of destroying the corpus luteum by the cautery point, crude and imperfect as it was, is an illustration of the same method as applied to this structure. The indispensa-

Fig. 6.—Wall of corpus luteum in stage of late vascularization, approaching maturity (low power).

bility of the corpus luteum to menstruation can be determined with far greater accuracy, however, by the histologic method. During the menstrual life of the normal woman, lutein tissue in some stage or another of development is always to be found in the ovaries. On the other hand, in the nonmenstruating woman corpora lutea are absent. Many cases might be described to illustrate this fundamental rôle of the corpus luteum in menstruation.

While it is true that a greater or less degree of maturation of graafian follicles is frequently observed in the ovaries of girls before puberty, and even in those of fetuses and new-born children, corpora lutea are never found. Although I have studied a considerable number of very young ovaries, I have never observed a corpus luteum in them. On the other hand, I have frequently seen well developed graafian follicles and atresic follicles.

To pass to the other extreme of menstrual life, corpora lutea are never found in the ovaries of women who have ceased to menstruate. For a number of months after the last menstrual flow, retrogressive corpora lutea are, of course, present, and degenerated lutein cells may be observed; but this does not alter the general rule.

Of especial interest in this connection is the amenorrhea of lactation. That ovulation occurs during this period is obvious from the frequency with which impregnation occurs among nursing women. Certainly, therefore, one must expect to find corpora lutea in the ovaries of lactating women. Why, then, is menstruation so frequently absent during lactation? The evidence all indicates that the menstrual function of the corpus luteum is nullified by the new element which comes into activity during lactation, i. e., the influence of the functioning mammary gland. This influence is exerted through the medium of a hormone, which tends to inhibit or to counteract the secretion of the corpus luteum. A similar explanation suggests itself with regard to the amenorrhea of hypopituitary obesity (dystrophia adiposogenitalis), while the amenorrhea of anemia, phthisis and other debilitating conditions is due either to an inhibitory effect on the secretory cells of the corpus luteum, or, more probably, to the failure of ovulation itself. Which of these two factors is responsible can be determined only by the careful study of ovaries from women suffering from these various diseases. So far as I know, such studies have not yet been made.

With regard to the opposite condition of excessive menstruation, the problem is much more difficult and complex. Many factors are to be considered in attempting to explain uterine bleeding, as emphasized in a previous paper before this section.[7] At present, however, we are dealing only with the possible rôle of the ovary in this connection.

As is well known, Hitschmann and Adler[8] have attempted to show that in the great majority of cases uterine bleeding is due to either functional or organic disturbance in the ovaries. For example, such conditions as salpingitis are especially apt to produce excessive menstruation when the ovary is involved in the inflammatory disease. When the ovary is free, there is less likelihood of menorrhagia or metrorrhagia. This rule, if I may so speak of it, does not, of course, apply to diseases such as carcinoma of the uterus, in which the bleeding is due to actual local destruction of tissue and invasion of blood vessels by the disease.

Since it seems to be demonstrated that the corpus luteum is the cause of normal menstruation, it would

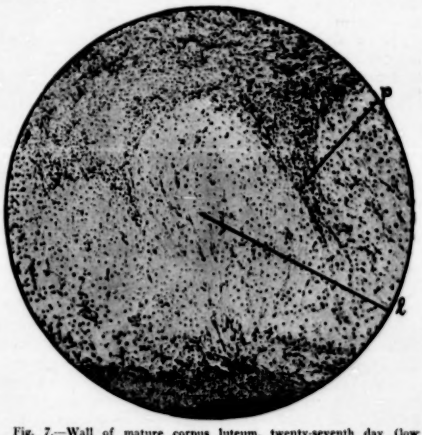


Fig. 7.—Wall of mature corpus luteum, twenty-seventh day (low power), showing lutein (*l*) and paralutein (*p*) cells. The latter are found in the wedgelike septa.

seem most probable that we must look to disturbance of this structure for an explanation of the disorders of menstruation. The histologic evidences of hyperfunction would naturally be either overdevelopment of

7. Novak, Emil: The Pathologic Physiology of Uterine Bleeding, THE JOURNAL A. M. A., Aug. 22, 1914, p. 617.
8. Hitschmann and Adler: Arch. f. Gynäk., 1913, c, 233.

the normal corpus luteum, of the presence of other lutein tissue than that to be found in the corpus luteum (accessory corpora lutea, corpus luteum cysts, etc.). A careful analysis of my cases has failed to reveal anything like a direct relation between the degree of lutein development in the ovary and the clinical intensity of the menstrual flow. Speaking generally, the corpus luteum from a case of excessive menstruation shows no greater development than that from a case of scanty menstruation at a corresponding stage in the menstrual cycle. Such a conclusion is not justified unless both ovaries are thoroughly ransacked in all parts so that no lutein tissue structures will be overlooked. This was done, as has been mentioned, in 102 cases of this series, and it is of course on these alone that I have based the assertion that variations in the amount of menstrual flow are not due to differences in the degree of development of the lutein tissue of the ovary. This does not, however, preclude the possibility of functional increase or decrease being the cause of increase or decrease in the menstrual reaction. Nor can we forget the all-important fact that even though the ovarian secretion is the immediate cause of menstruation, this function is also influenced by practically all the other endocrine glands of the body. The ovary is merely the portal through which the entire ductless gland change exerts its influence on the functions of the female generative organs. Whereas formerly anatomic causes were presupposed in practically all cases of uterine bleeding, now the evidence is pointing more and more clearly toward the importance of functional disturbances in the ovary and of the endocrine system of which it is a part. To this general principle, the bleeding caused by such actually destructive lesions as cancer is of course an exception.

26 East Preston Street.

Fig. 8.—Contrast between lutein and paralutein cells, near top of septum shown at *p*, in Figure 7 (high power).

ABSTRACT OF DISCUSSION

DR. CAREY CULBERTSON, Chicago: I was pleased that Dr. Novak regards the lutein cell as the histologic derivative of the membrana granulosa—hence of embryonic epithelial origin—rather than as modified from the internal theca. This opinion is in accord with my own teaching during the past ten years. The corpus luteum must be thought of as implying not only folliculation, but ovulation, hence I agree with the speaker again in his remarks anent Dr. Reynold's description of the atretic follicles, that is, that in the atretic follicle the band of more or less degenerated cells does not represent lutein cells. A follicle that has become cystic before casting off its ovule can never develop a corpus luteum, hence, can never produce a hormone, nor eventually result in a corpus albicans. Another point in Dr. Novak's paper which requires reinforcement is that pertaining to the theca interna. This represents a very interesting cell change, indeed, on which the corpus luteum seems to be absolutely dependent. The corpus luteum must not be thought of as a histologic entity in that it can exist by itself, be transplanted, etc. It depends for its cell development, for its activation, directly on the underlying theca wherein we find the essential blood supply. Indeed, after all, the term "activation" may mean nothing but vascularization—the dilatation of capillaries with the consequent imbibition of serum whereby certain special cells reach the height of development and are thereby able to produce a certain active principle called a hormone.

DR. E. NOVAK, Baltimore: As Dr. Culbertson remarked, the tendency in this country has apparently been in favor of the connective tissue origin of the lutein cell, probably as a result of the influence of certain American writers. If such observations as those which I have reported are confirmed, it will be necessary to revise this teaching. The evidence of the epithelial origin of these cells is based on the following observations: (1) The membrana granulosa is not lost after follicular rupture, but remains practically intact and virile; (2) a direct transformation of the granulosa cells seems to have been demonstrated; (3) the theca cells, while epithelioid and fatty shortly after follicular rupture, soon exhibit a retrogression to the ordinary connective tissue type; (4) if, as seems almost certain, the paralutein cells are derived from the theca interna, the lutein zone must represent the transformed granulosa; (5) exhaustive studies of the corpus luteum in lower animals have clearly demonstrated the epithelial origin of the lutein tissue in these animals. The time is soon coming when the mystery which has always enshrouded the menstrual phenomenon will be dissipated. We are rapidly accumulating facts which will sometime enable us to treat menstrual disorders as rationally as we treat such analogous disorders as those of the thyroid gland. There can be little doubt that perfected organotherapy will play a more important rôle in the management of many of these cases in the future than it has in the past.

Mutations of de Vries.—It would appear from the researches of de Vries and other botanists that the sudden alterations of structure and function which may be known as mutations of de Vries are of far more general occurrence among plants than among animals. Such mutations are attributable to sudden alterations of molecular and atomic constitution. Sensitiveness to the biochemical reactions of the physical environment should theoretically be more evident in organisms like plants which derive their energy directly from inorganic compounds which are constantly changing their chemical formulae with the conditions of moisture, of aridity, of temperature, of chemical soil content than in organisms like animals which secure their food compounds ready-made by the plants and possessing comparatively similar and stable chemical formulae. Thus a plant transferred from one environment to another exhibits much more sudden and profound changes than an animal, for the reason that all the sources of plant energy are profoundly changed while the sources of animal energy are only slightly changed. The highly varied chemical sources of plant energy are, in other words, in striking contrast with the comparatively uniform sources of animal energy which are primarily the carbohydrates and the proteins formed by the plants.—The Origin and Evolution of Life Upon the Earth, Henry Fairfield Osborn.

LEPRA MUTILANS

MELVIN S. ROSENTHAL, M.D.
Fellow of the American College of Surgeons
BALTIMORE

History.—C. C., a colored bootblack, aged 22, single, applied to Dr. John Chambers of the Mercy Hospital, April 10, 1916, for ulceration and necrosis of fingers of both hands. Suspecting the possibility of leprosy, Dr. Chambers referred the patient to the dermatologic department, where the following history was elicited: The patient was born in Demerara, British Guiana, in 1893. The mother died of dropsy about fifteen years ago. The father was living and well. A brother and sister were living and apparently healthy. There was no history of any skin disease on either side of the family. In 1897 the family migrated to Barbados, West Indies, where the patient remained until 1907, coming to New York as a laborer. The following year he came to Sparrows Point, Md., and worked in the iron mills. At about this time the patient noticed a slight contraction of the fingers of both hands which was not serious enough, however, to incapacitate him from work. While engaged at his occupation he dropped a bar of hot iron on his foot, and in removing it severely burned his fingers and toes. The burns were painless and showed but slight disposition to heal, the injured surfaces remaining denuded of skin, the soft tissues gradually receding from the bone, leaving the ends of the bones exposed and charred. These finally sloughed off, leaving ulcerated surfaces on the fingers but clean cicatricial masses on the toes. Subjectively the only symptoms were loss of sensation in hands and feet, with slight burning and tingling in the parts. Except for the discomfort arising from the loss of fingers and toes and the unsightliness of the disease, the patient had suffered no pain or inconvenience, being able to follow his occupation until the diagnosis of leprosy was made.

Fig. 1.—Lepra mutilans: mutilation of fingers, leukodermic spots on arms, loss of septum, eyebrows and eyelashes; face studded with many tubercles, which are especially prominent around the mouth and chin.

Examination.—The patient was a well nourished black negro apparently about 40 years of age. There was slight alopecia presenilis without evidence of inflammation. The skin on the face was thickened, indurated and covered with a large number of tubercles of various size and shape. Around the mouth, chin and nose they were especially abundant. The eyebrows and eyelashes were scant, and the beard practically lost. There was a mass of ulcers on the mucocutaneous margin of the lips. The nasal fossae were studded with a large number of ulcers extending into the posterior nares. There was complete loss of septum, flattening the nose against the face. Both external ears were covered by many small tubercles extending deep into the auditory canal. Many of these tubercles were broken down and suppurating. Both hands were covered with a black, foul smelling débris, but slightly adherent to the skin. The removal of this mass showed many ulcers and scars. There was complete destruction of the little fingers of both hands. Both thumbs were thickened, and there was destruction of the terminal phalanges. On the right, the phalanx remained as a charred mass, and was readily removed by slight traction. The other fingers were thickened and partly destroyed. The ends of the stumps on all the fingers were open and suppurating. The back of both hands and forearms were covered with numerous leukodermic spots, circinate in outline with central loss of pigment. There was no apparent change in the muscular structure of forearms or hands. There was complete anesthesia of both arms extending in an irregular outline from the elbow down. Large sections were removed from the hands for microscopic examination without causing the slightest pain. There was complete destruction of all the toes on the left foot, a clean, healthy cicatrix covering the entire area. On the right foot there remained part of the great toe; the second toe was ulcerated and partly destroyed; the other toes were destroyed. On the inner surface of the right foot was a long scar, the result of a surgical operation for supposed gangrene. There were a few leukodermic spots on both feet. There was complete anesthesia below the knee. There was palpable thickening of the ulnar and median nerves, with evidences of nodes. The ankle and patellar reflexes were lost. The Wassermann test was negative. Smears made from the nose, mouth and hands showed the presence of large numbers of rod shaped, acid fast organisms found in groups and closely resembling the tubercle bacillus. In sections the same organisms were found. Roentgenograms of the hands showed a symmetrical destruction of the phalanges of both hands.

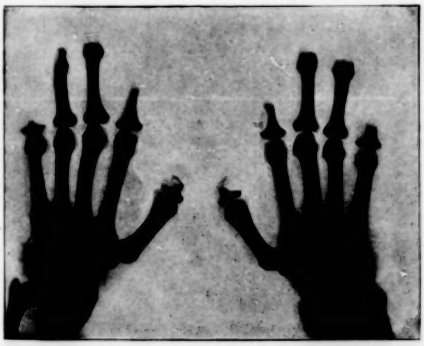


Fig. 2.—Symmetrical destruction of bones of hands.

The syndrome of the clawlike contraction of the fingers, followed by painless and gradual loss of the digits, the complete anesthesia, mutilation and thickening of the face, the ulceration around the mouth and nose, and the leukodermic spots on the hands and feet, identify this as a case of leprosy without the refinement of differential diagnosis, yet a number of unusual features makes it of more than ordinary interest.

It is difficult to conceive that a man with so pronounced and evidently serious a skin disease should have entirely escaped a diagnosis in spite of the fact that within a year he had been treated both as an ambulatory and a bed case in several hospitals. The rapidity of the tuberculous and destructive process in the face had been unusually rapid. The amount of mutilation which had taken place in this patient in about a year ordinarily takes from three to five years. He had been able to follow his occupation as bootblack continuously until the diagnosis was made. By

Fig. 3.—Complete spontaneous amputation of toes of left foot, leaving a healthy cicatrix; partial amputation of toes of right foot, showing ulcers and denuded bone; scar of inner surface, result of operation for necrosis.

means of leather bands into which his hands were fitted he was enabled to hold his brushes and shine shoes. His stand was in the neighborhood of the Mercy Hospital, and his patrons were largely medical students, and it was through the curiosity of a medical student that he was induced to visit the Mercy Hospital.

The horror with which the public views leprosy makes the disposition of these cases a difficult problem. While direct evidence is lacking as to the communicability of the disease in this climate, it is assuredly hazardous and undesirable to allow absolute freedom to a poverty stricken individual lacking all the facilities of ordinary cleanliness, living in filth and squalor, and incapacitated by his deformity from caring for himself. Smears made from the hands, mouth, nose and lips were filled with the lepra organisms, and in our present state of uncertainty it would be prudent to isolate these patients.

The case was originally reported to the health department, April 13, as a case of leprosy; but up to the present time (June 9) the department has taken no official recognition of the disease, treating the patient simply as a pauper, and referring him to the supervisor of city charities for admission to the almshouse. This department in turn, claiming leprosy to be a menace, has refused him admission, transferring the case to the City Charity Organization Society for financial assistance.

In the meantime, the man continues to roam at freedom, using the street cars and telephones, handling money as he sees fit, and living in the same sordid, unhealthy surroundings in which he was originally found.

This case well illustrates the urgent need of a national leprosarium where these unfortunates can find a permanent refuge and the community be spared the presence of an unsightly, mutilated and incurable human being awaiting the final call.

718 North Howard Street.

AN UNUSUAL FRACTURE OF BOTH BONES OF THE LEG

CHARLES RYTTENBERG, M.A., M.D., PORT CHESTER, N. Y.
Associate Surgeon, the United Hospital

Lester B., boy, aged 5 years, while crossing the street, was struck by the mudguard of an automobile, and knocked down. The blow was a glancing one, as the driver in endeavoring to avoid striking the child ran his machine on the sidewalk.

Examination of the child a few minutes after the accident revealed a slight abrasion over the inner side of the right arm, and refusal of the child to stand on its feet. The only subjective symptom was pain above the left ankle. The examination of the left lower extremity showed no dislocation at any joint. There were no swelling, no false motion, no ecchymosis, no crepitus. Movements at the ankle and knee were normal. Slight tenderness was present at the junction of the lower and middle thirds of the leg. Motion transmitted upward by striking against the heel elicited tenderness at about the same place. This transmitted tenderness was not a very marked sign. There was not sufficient reason to suspect a fracture, so a wet dressing was applied, and the child kept in bed. When seen the next day, the symptoms were practically unchanged: no swelling, no ecchymosis, no false point of motion and no crepitus. In fact, the only symptoms were refusal of the child to stand on the leg, slight tenderness at the junction of the lower and middle thirds of the leg, and slight tenderness transmitted by pressure against the heel.

On account of the peculiar character of the case, a Roentgen examination was made. The findings were unexpected: There was an oblique incomplete fracture of the tibia in the lower third of the bone, extending from the inner side upward and outward to within about an eighth of an inch of the outer side. At a point directly opposite the fracture of the tibia, there was a marked inward bowing of the fibula, strongly suggestive of a greenstick fracture.

Oblique fracture (incomplete) of tibia; greenstick fracture of fibula.

The leg was immobilized in plaster, without any attempt being made to correct the deformity of the fibula. An uneventful recovery followed in three weeks, with complete restoration of function.

A View of Life.—There is no such thing as a common, a humdrum or a sterile life, unless we make it so ourselves. "The rainbow and the rose," says my author, "will give their colors to all alike. The sense of beauty that is born in every soul pleads for permission to remain there." If we will but look for it, there is something ennobling and uplifting in every vocation to which a man can put his hand. Every activity of life has its material aspect and its spiritual aspect. It has its result in visible accomplishments, and it also has its result in invisible mind-building, will-building and intellectual enjoyment.—Nicholas Murray Butler.

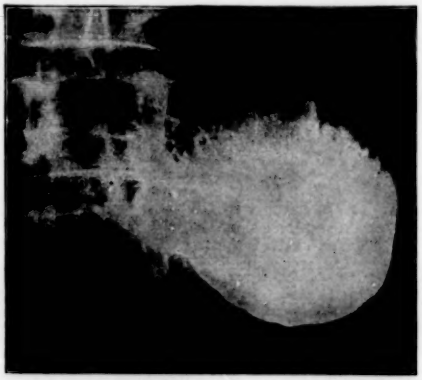
TRAUMATIC RUPTURE OF THE STOMACH, WITH RECOVERY

ALANSON WEEKS, M.D., SAN FRANCISCO
Chief Surgeon, Emergency Hospital Service

The patient, a man, aged 35, was brought to the Central Emergency Hospital at 6:20 p. m., Feb. 19, 1916. He was examined by Dr. Edmund Butler, the surgeon on duty, who made a record of the following findings, and notified me of the necessity for immediate operation.

A short time before, the patient, while driving his automobile, ran into a moving street car, striking the upper abdomen against the steering wheel with great force. Examination showed the patient conscious, with very severe pain in the epigastric region; lacerated wound of the chin; contusion of the scalp; abdomen flat and rigid (boardlike), and extremely tender; liver dulness present; no dulness in flanks; no nausea or vomiting, and no blood in urine.

A diagnosis of rupture of the bowel was made, and operation performed immediately. A midline epigastric incision was made. The preperitoneal fat was hemorrhagic; the posterior sheath of the rectus was ruptured; there was no gas or blood when the peritoneal cavity was opened, but when the stomach was lifted into the wound, gas and blood escaped from the region of the pylorus. One inch from the pylorus the stomach was ruptured through the entire thickness, from the lesser to the greater curvature, on the anterior, and through all but the peritoneal coat of the posterior surface, from the lesser curvature, more than half way across, to the greater curvature. It was rather difficult to make out the exact nature of the injury, because of the fact that the mucous membrane and muscular and peritoneal coats were separated in the region of the wound. There was marked hemorrhage from the torn edges. The rupture of the posterior wall was closed through the anterior opening, with a continuous catgut suture, in one layer; the anterior wall was closed with a continuous catgut suture in two layers. A rubber tube drain was placed to the region of the tear. There was no other bleeding in the abdomen. The patient received 1,000 c.c. of normal salt solution intravenously on the table.



Roentgenogram of stomach two hours after eating.

He was returned to bed, and at 12:30 had a pulse of 104, respiration 22, and was resting comfortably. Continuous glucose bicarbonate drip was given by bowel for four days. He required but two hypodermics for pain, following the operation. Small amounts of water by mouth were started, February 22, and February 23 he was allowed small amounts of malted milk. On the 24th, he had an even temperature, and the pulse was 88 and the respiration 18. Recovery was uneventful. He walked from the hospital, Feb. 28, 1916, and was driving his car and attending business two weeks from the date of injury. Two months after the operation he is evidently in perfect health.

The accompanying roentgenogram of his stomach speaks for itself. Dr. Howard E. Ruggles makes the following report of his Roentgen findings: "Stomach high and central, with dilated cardia and body, and a persistent defect in the antrum 2 inches inside the pylorus. Also, persistent contraction of the duodenal cap, which never filled completely, and which emptied rapidly. At two hours after eating there was still one-third residue in the stomach, and at six hours the stomach was entirely empty."

STRICTURE OF THE ESOPHAGUS

REPORT OF A CASE

WALTER M. BRUNET, M.D., LYNCHBURG, VA.

History.—Negro, aged 35, laborer, about sixteen months ago swallowed an ounce of concentrated lye by mistake, thinking it was water, with the usual result of the ingestion of such material. He was seen shortly after the accident by a physician in the country near his home, who administered demulcents for the burned condition of his mouth and throat.

The acute symptoms subsided after several days, and he felt no ill effects until some weeks after the accident. He first noticed that if he took any liquids in a hasty manner he would regurgitate some of them, and if he ate solid food of any kind without chewing thoroughly (fletcherizing) he would expel them.

This condition increased for about a year, and at this time he consulted a nose and throat specialist who referred him to a general practitioner for treatment. The doctor dilated the stricture on several occasions, using flexible graduated bougies, and the patient states that he was very much improved by the procedure and could eat with less discomfort. After this he did not consult a physician for a year.

Present Illness.—The patient states that while in the act of drinking lemonade he swallowed a small lemon seed, and it "stuck in his throat," and he was unable either to swallow it or regurgitate it.

He was seen shortly after the accident by two physicians, and both attempted to dislodge the obstruction by bougies, but without success. The man's thirst was intense, as the heat during this period, June, 1915, was extreme, and the man was unable to retain any fluids taken by mouth. About twenty-four hours after the accident he came to this city and consulted a nose and throat specialist, who referred him to me.

Physical Examination.—The patient was fairly well developed and well nourished, and was very weak and exhausted in appearance, owing to the torrid weather and lack of fluids. At the time of this examination he had had no fluids for over twenty-four hours.

He was given water in small quantities, and a string was tried, but after retaining them for a few moments they would be ejected. Then a small olivary tipped bougie was passed, and it met an obstruction about 14 inches from the teeth. After the patient had been subjected to this torture for some time he was sent to a roentgenographer for an examination.

A roentgenogram was taken after the ingestion of a small quantity of bismuth, and this showed the esophagus to be occluded, and the outlines of a lemon seed could be plainly seen.

The patient was then sent to the hospital and rectal alimentation resorted to for some hours.

Operation.—Under general anesthesia a left rectus incision high up under the costal margin was made, and the stomach located and pulled up into the wound and incised. The finger was then passed into the cardia, but the constriction was so high up that it could not be palpated. A small bougie was then passed into the esophagus from the cardia, and it became obstructed about 12 inches from the latter. After several attempts a small uterine sound was successfully passed beyond the constriction, and with this in place a

small bougie was passed from the mouth, and on the withdrawal of the sound the bougie was carried into the stomach. This was gently pulled all the way into the stomach cavity, and successive sizes passed until a fairly large dilation was obtained.

During this manipulation the lemon seed was pushed into the stomach; it was of usual size and was intact from its position in the esophagus.

After these manipulations had been carried out, a rubber tube was sutured into the stomach wall after the method of Senn.

Postoperative Course.—For the first twenty-four hours the patient had a rather stormy course, but after this his condition rapidly improved, and at the end of the fourth day he was able to take food by mouth with a fair degree of comfort. At the end of the sixth day graduated bougies were passed twice a day, and at the end of the ninth day the tube in the stomach was removed, and the patient left the hospital on the fifteenth day.

Since his discharge from the hospital he has kept up the passing of the bougies, which has been about twelve months. He eats anything and has had absolutely no trouble with the passage of food through the esophagus.

He has now gained 40 pounds and works every day as a section hand on one of the railroads which come into the city.

REPORT OF A CASE OF ACQUIRED HEMOLYTIC JAUNDICE WITH SPLENECTOMY

G. A. FRIEDMAN, M.D.
Attending Physician in Digestive Diseases, Vanderbilt Clinic; Gastro-Enterologist, Gouverneur Hospital
AND
ELIHU KATZ, M.D.
NEW YORK

While a great deal has been written and elaborate studies and experiments have been made to determine the nature of hemolytic jaundice, it was not until 1898, that Hayem,[1] through a study and analysis of cases, first showed that the familial and the acquired types were two entirely separate and definite conditions. Since then many experimenters and clinicians have substantiated his conclusions. A review of the summary on hemolytic jaundice made in 1915 by Elliott and Kanavel,[2] who were the first in this country to report on splenectomy in the familial form, reveals the fact that a splenectomy was done in but thirteen cases of the acquired type, and that all these cases have been recorded in foreign literature. This lack of case reports in the American literature has served as a stimulus for recording the following case:

CASE REPORT

History.—M. T., male, aged 18, tailor, white, born in southern Italy, eighteen months in this country, first came under observation at the Vanderbilt Clinic, Nov. 9, 1915. His parents, three brothers and three sisters, all of whom are living, are in good health. There is no history of icterus in the family. Aside from the fact that when very young he had a fever that lasted three days, he never had any illness. A history of venereal infection could not be elicited. He had never used alcohol, tobacco or drugs. He had been in good general health until eight months previously, March, 1915, when he noticed that his skin and his eyes were becoming rather rapidly lemon colored. In about two days, the jaundice was deep, he felt drowsy, was weak, and had to go to bed. On the third day he had high fever, sweat a good deal, and had several distinct chills. The high fever with the severe chills and sweats persisted for two weeks during which he remained at home and in bed. The yellow discoloration of the skin and mucous membranes, however, which had by this time become less intense, was nevertheless quite marked. At the beginning of the third week the fever, sweats and chills decreased in severity, and the patient resumed his work at which he remained until his admission to the Roosevelt Hospital, Nov. 17, 1915. During this entire period, he had a daily fever of from 99 to 100, which appeared regularly in the afternoon, which was preceded by a slight chill lasting for about five minutes, and which was followed by sweating. At no time did he have itching of the skin. For a few months prior to his admission to the hospital, in addition to the symptoms mentioned, he complained of a heavy feeling, distention, and tenderness in the epigastrium. These appeared about half an hour after meals and continued from ten to twenty minutes. He had, however, no distinct pain, localized or radiating, and no vomiting or nausea. His bowels moved daily. The stools were yellow, not offensive, of normal consistency, never contained mucus or blood, and were never clay colored. He had no burning on micturition, and no urgency or frequency of micturition. His urine was always of normal color. During the eight months of his illness he had lost 6 pounds in weight.

Physical Examination.—When examined his pulse was 72, respiration 18, and temperature 100. His nutrition was fair. The skin and visible mucous membranes were distinctly icteric, and there was a slight acne rash on the back of the chest. The tongue, teeth, pharynx, tonsils and eyes were normal. The heart and lungs were negative. The abdomen was relaxed and there was slight tenderness in the epigastric region, especially to the left of the midline. The liver was not palpable and on percussion did not seem to be enlarged. The spleen, however, was distinctly enlarged, the sharp inner border being felt near the midline, and reaching almost to the umbilicus, and the lower pole being 4 inches above the crest of the ilium. The consistency was about normal, the surface smooth, and not tender. The genitalia, extremities and reflexes were normal.

Laboratory Examinations.—Nov. 9, 1915, the blood examination showed hemoglobin 68 per cent., erythrocytes 4,500,000, and leukocytes 4,200. The differential count of 200 white cells showed polymorphonuclears 78.5 per cent., small lymphocytes 12.5 per cent., large mononuclears 4 per cent., eosinophils 2 per cent., basophils 0.5 per cent., and transitional cells 1.5 per cent. Slight poikilocytosis was present and the crenation of the red blood cells was marked. No pigmented or other abnormal erythrocytes were found. A careful and repeated search for malarial plasmodia proved negative. Blood withdrawn for the Wassermann reaction also gave negative results, but tests for bilirubin in the blood serum were strongly positive.

Gastric analysis made, November 10, after a test breakfast, showed free hydrochloric acid 40, and a total acidity of 60. There was no blood in the extracted contents, but a very slight trace of bile was present. An examination of the stool made the same day showed the feces to be normal in color and consistency. Microscopic examination revealed a large quantity of cellulose, with a few starch granules. No fat globules or ova were found. The particles were heavily tinged with bile.

Successive daily analyses of the urine gave negative reactions for albumin, sugar and bile. The urobilinogen and urobilin tests were repeatedly strongly positive. Microscopically the urine was continually negative.

November 15, the patient was referred to Dr. Mortimer Warren, pathologist to the Roosevelt Hospital, who reported as follows: Blood count showed erythrocytes 4,200,000, with a hemoglobin of 78 per cent. The white blood cells totaled 4,200, with a differential count of polymorphonuclears 75 per cent., lymphocytes 15 per cent., large mononuclears 1 per cent., transitionals 5.5 per cent., eosinophils 3.5 per cent. The color index was 0.9 per cent. Anisocytosis and poikilocytosis were present. There was no polychromatophilia or granular basophilia. By vital staining 16 per cent. of the red

1. Quoted from Krumbhaar (Footnote 7).
2. Elliott and Kanavel: Splenectomy for Hemolytic Icterus, Surg., Gynec. and Obst., 1915, xxi, 37.

blood cells showed granulation. A few microcytes and blood platelets were found, but no parasites. The average size of twenty dried smear red blood corpuscles measured 7.2 by 5.8 mm. The volume of the red cells was 31 per cent. The resistance of the red cells to hypotonic salt solution was determined, and somewhat diminished values were obtained, the minimum being 0.45 per cent., and the maximum 0.3 per cent. The blood serum was orange colored, and responded to the test for bilirubin. Auto-agglutination and isohemolytic tests were negative. The urine examined at this time contained no bile, but gave distinct reactions for urobilinogen and urobilin.

Diagnosis.—Diagnosis of acquired hemolytic jaundice was made. The chronic enlargement of the spleen, the acholuric nonobstructive jaundice not causing pruritus, the absence of bile from the urine and the presence of bilirubin in the blood serum, the positive reactions for urobilin and urobilinogen in the urine, the anemia, and the granulation of the red blood cells with their slightly increased fragility to hypotonic salt solutions all pointed to this condition. From the fact that there was no hereditary basis for the icterus, and from the late and rather sudden onset, it was evident that the case belonged to the acquired type.

Treatment.—Although roentgenotherapy was considered, a splenectomy was advised. This was done at the Roosevelt Hospital, Nov. 23, 1915, by Dr. Charles Peck, assisted by Dr. Street. Under ether anesthesia an incision was made along the left border of the left rectus muscle from the rib margin to the umbilicus. Palpation of the gallbladder, gallducts, liver, stomach and pancreas was negative. The spleen was considerably enlarged, firm, but not indurated, and fairly free from adhesions except along its posterior border and to a moderate extent at the upper pole. The adhesions were freed, allowing the delivery of the spleen forward. The pedicle of the spleen was then ligated and the spleen removed. It weighed 800 gm. The wound was then closed in the usual manner. The operation was well borne, and the patient made an uneventful recovery. It is interesting to note that the icterus began to disappear immediately after the operation, and was almost entirely gone at the end of a week. Four weeks later the patient resumed his work.

Pathologic Report.—This report was made by Dr. Mortimer Warren. The spleen measured 17 by 10 by 7 cm. On macroscopic examination it was found to be soft and flabby. It cut easily and the cut surface presented a dark red, rather granular appearance. The trabeculations stood out prominently. Microscopic examination showed that the capsule was not thickened and that the trabeculae were not prominent. The follicles varied in size, and there were areas of considerable extent without any follicles, some having disappeared. Occasionally, a follicle presented a marked activity, showing a central cluster of large mononuclear cells analogous to the germinal centers of lymphoid nodes. The follicular arterioles were not thickened. The lumina in some instances appeared narrow, as if compressed, but it was impossible to correlate the disappearance of a follicle with any change in the artery. In general the small arteries stood out prominently, more by contrast with the surrounding elements than by an increase in size. The pulp consisted largely of red blood cells. The peculiar pulp cells were scanty. There was no evidence of proliferation or adventitial myeloid transformation aside from a very occasional eosinophilic polymorphonuclear leukocyte in the pulp. As a rule, the sinuses were empty and compressed. Here and there one was widely distended. The striking feature was the interstitial suffusion with red blood cells. There was no phagocytosis. On his findings Dr. Warren made the diagnosis of interstitial congestion of the spleen. Sections of the spleen treated with potassium ferrocyanid and hydrochloric acid showed an unusually small amount of iron-containing pigment.

Results.—The results obtained by the splenectomy were striking. Two days after the operation, November 25, the white blood cells rose to 24,000. The polymorphonuclear leukocytes were 80 per cent. November 29 Dr. Warren reported as follows: Hemoglobin 88 per cent., red cells 5,120,000, the color index being 0.9; total number of leukocytes 11,000, the differential count of 300 cells showing, polymorphonuclear leukocytes 73.6 per cent., lymphocytes 14.6 per cent., large mononuclears 0.3 per cent., transitionals 7.3 per cent., eosinophils 3 per cent., and basophils 1.2 per cent. There was no anisocytosis or poikilocytosis. The vital staining showed few granular or reticulated red cells. No microcytes were seen, but large masses of platelets were found. The auto-agglutination and the isohemolytic tests were again negative. The resistance of the red blood cells was for the minimum 0.5 per cent. and for the maximum 0.35 per cent. The urine contained urobilin but no urobilinogen.

December 20, about one month later, the blood count showed: hemoglobin 80 per cent., the total count of red cells being 5,440,000. The white blood cells numbered 18,600, the differential count being: polymorphonuclear leukocytes 70 per cent., small lymphocytes 16 per cent., large mononuclears 3 per cent., eosinophils 2.5 per cent., basophils 1 per cent., and transitionals 7.5 per cent. No large lymphocytes were seen. A urinalysis at this time showed an absence, both of urobilinogen and urobilin. December 29, the hemoglobin was again 80 per cent., and the red cell count was 5,500,000. The number of white cells dropped to 5,400, the differential count being: polymorphonuclears 47.5 per cent., small lymphocytes 39 per cent., large lymphocytes 0.5 per cent., large mononuclears 2 per cent., eosinophils 6 per cent., basophils 0.5 per cent., and transitionals 4.5 per cent. The resistance of the red cells was normal, and reticulated or granular red cells were not seen. The urine was negative.

The patient, when last seen, March 20, 1916, had no subjective symptoms, and there was no sign of icterus. The blood and urine were normal.

COMMENT

Hemolytic jaundice is associated with an increased blood destruction resulting in a somewhat characteristic blood picture and blood findings, an icterus and a splenomegaly. The cause for the hemolysis is not at all clear, but recent operative and experimental results have proved that the spleen is an essential, if not the main, factor in the etiology of the disease, but that, as in other hemolytic diseases, pernicious anemia, for instance, many other factors are perhaps involved. The liver too, probably, plays an important rôle. Just how the spleen and liver act, however, is not definitely known. Vogel[3] believes that the spleen probably acts by bringing the red blood cells more closely into contact with the pulp cells, where there is not so much blood destruction; but, perhaps, the red cells are so affected or sensitized as to render them more susceptible to hemolytic action on the way to the liver, or, more probably, to destruction by the Kupffer cells of that organ. The enormous hyperemia in the spleen sinuses, with practically no large phagocytic cells containing red blood corpuscles or blood pigment, the absence of excessive iron deposition in the organ, and evidence of marked stasis of blood with relatively little blood destruction, seem to favor this view.

The spleen has been classed with the ductless glands. It is said to have an internal secretion the function of which is not yet understood, and, like other glands of internal secretion, it may be removed with apparently no harm. One of the special functions of the secretion is believed to be hemolytic, and a hyperactivity of splenic function due to some unknown pathologic condition and resulting in an increased internal secretion, leads to an excessively marked hemolytic action, regardless of whether this hemolysis takes place in the spleen itself, the general circulation, the liver, or elsewhere. To this condition Eppinger[4] has given the name "hypersplenism." The hemolysis disappears, or

3. Vogel, Karl M.: Theories of the Etiology of Pernicious Anemia, THE JOURNAL A. M. A., April 1, 1916, p. 1012.
4. Quoted from King (Footnote 5).

is strikingly altered, when the spleen is removed; furthermore, an extract has been obtained from the spleen that has been described by some experimenters as having hemolytic properties. The evidence for this, however, is still very meager.

Another possible explanation of this condition is found in the association of unsaturated fatty acids and hemolysis. It should be mentioned that Eppinger[4] and King[5] have shown that an increase in the unsaturated fatty acids, which are definitely known to be hemolytic, has been found in the blood where there is red blood cell destruction. By splenectomy the amount of these unsaturated fatty acids is reduced. Moreover, in a series of animal experiments, King has found in every case an increase in the total fats and cholesterin in the blood. The latter substances are a protection against hemolytic agents, and their increased quantity may be a protection against hemolysis.

The blood in hemolytic icterus has certain features. Widal and Chauffard[2] were the first to show that there is an increased fragility of the red blood corpuscles. It has been observed, however, that this decreased osmotic resistance to hypotonic salt solutions is not constantly present in all cases, probably owing to the fact that the fragility, depending on unknown factors, changes from time to time. It has also been demonstrated that the fragility may, even though rarely, persist for a long time after the splenectomy has been done. Some authors have reported an increased fragility in other conditions, as in nephritis with severe anemia, but this is a rather unusual occurrence. After a splenectomy the fragility in the acquired type disappears as a rule, but in the successful splenectomies of the familial type performed by Kohn and Roth,[1] the resistance of the red blood cells failed to return to normal. Pearce, Austin and Evans[6] found that after removal of the spleen the resistance of the red blood cells is increased.

In the acquired form of hemolytic jaundice the phenomenon of auto-agglutination has been described by Widal, Abrami and Brule.[1] This they have found to be positive in every case of the acquired type, and negative in all congenital cases. In the case reported, however, there was no auto-agglutination either before or after the operation. In some rare instances the blood serum may contain isohemolysins.

Microscopic examination shows an increased number of microcytes and of reticulated or granular red blood cells brought out by the method of vital staining. Chauffard[1] first called attention to this in the congenital type, but their presence has been shown also in the acquired type. Normally there is 1 per cent. of reticulated red cells in the blood. In hemolytic jaundice it may be increased from 5 to 20 per cent. The increased number of reticulated red corpuscles is generally considered a sign, not of excessive blood destruction, but rather of a hyperactivity of blood formation.

The anemia in hemolytic icterus is not, as a rule, severe. In an analysis of 158 cases of both types of hemolytic jaundice in which blood counts were made, Krumbhaar[7] found that fifty-five belonged to the acquired form and 103 to the congenital or familial type. The average red cell count of the fifty-five acquired cases was 2,032,200; the counts ranged from 1,000,000 to 4,500,000; ten cases showed a count which was below 1,000,000. In twenty-seven the count was below 2,000,000, and in only four cases was it over 4,000,000. Pearce[1] and his co-workers have shown that after splenectomy in dogs a definite and prolonged anemia is produced. After splenectomy in hemolytic jaundice, however, the anemia disappears. It seems probable that the removal of a spleen that has undergone some pathologic change is followed by entirely different results from those which follow the removal of a normal spleen.

The chronic slight icterus so characteristic of the disease is the direct result of the destruction of the blood. The manner in which this jaundice is produced has been thoroughly explained. It is due to the obstruction in the bile passages caused by the extreme viscidity of the bile. The sequence in which this occurs is briefly as follows: By whatever agents produced, the red blood cell is destroyed with the liberation of the hemoglobin. This is then split into two parts; first, the iron-containing portion, or hematin, which is carried to the liver (Kupffer cells), bone marrow, kidney and other organs; second, the pigment-containing portion, or hemochromogen, which is taken up and excreted by the liver as bilirubin. Thus there is an increased formation and excretion of the bile pigments with an increased viscidity of the bile, which causes an obstruction to the flow of the bile in the smaller ducts. Reabsorption of the bile takes place, leading to the production of jaundice. The bilirubin may be demonstrated in the blood serum. The bilirubin in the intestines is converted into urobilinogen by the reducing action of the intestinal bacteria. This is absorbed and excreted by the kidneys. Urobilin and its antecedent, urobilinogen, may be demonstrated in the stools, and as has been suggested by some in the duodenal contents.

The amount of blood destruction has been estimated by the amount of urobilin and urobilinogen in the urine and in the stools. Eppinger[4] assumed that one molecule of urobilin represented one molecule of destroyed hemoglobin. Addis,[8] however, has described a method for determining accurately the quantity of urobilin and urobilinogen excreted in twenty-four hours.

The splenomegaly is one of the principal characteristic features of the disease. The findings in the spleens, both in those removed by operation and in those which were obtained at necropsy, showed very little proliferation, if any, of the connective tissue. There was frequently great loss in the number of the follicles, and in a majority no germinal centers were to be seen. The splenic sinuses were dilated. Constant infiltration of the pulp with red blood cells was perhaps the most characteristic feature noticed. The endothelium of the blood vessels was proliferated and was filled with coarse hemosiderin. On necropsy nothing definite was found. The liver, however, showed a deposit of pigment, and this was also seen in the kidney and bone marrow. Eppinger[9] showed the presence of an enormous hyperemia in the spleen sinuses of pernicious anemia, as well as in hemolytic icterus. Pribram[10] has pointed out the fact that stasis of blood

5. King, John H.: Studies in the Pathology of the Spleen, Arch. Int. Med., August, 1914, p. 145.
6. Pearce, Austin and Evans: Reactions of Hemolytic Serum to Various Intervals After Splenectomy, Jour. Exper. Med., 1912, xvi, 363.
7. Krumbhaar, E. B.: Classification and Analysis of Clinical Types of Splenomegaly Accompanied by Anemia, Am. Jour. Med. Sc., 1915, cl, 227.
8. Addis and Wilbur: Urobilin, Its Clinical Significance, Arch. Int. Med., February, 1914, p. 235. Addis: A Working Hypothesis of Hemoglobin Pigment Metabolism, Arch. Int. Med., March, 1915, p. 413.
9. Eppinger, H.: Zur Pathologie der Milzfunktion, München. med. Wchnschr., 1913, xxxv, 1952.
10. Pribram: Hypersplenische Hämophtisen und Stauungsmilz, Wien. klin. Wchnschr., 1913, xxvi, 1607.

in the spleen, as caused by chronic passive congestion, is associated with an increased destruction of red blood cells. He also showed that urobilinuria could be easily caused by inducing congestion of the spleen. He therefore associated increased blood destruction, anemia and urobilinuria with stasis of the spleen.

In the treatment of hemolytic icterus, iron, arsenic and the Roentgen ray have been used, but in most cases gave little benefit. Jona[11] has reported a case of the acquired type in which Roentgen-ray treatment resulted in a cure, and strongly urges that this treatment be tried before attempting the removal of the spleen. He knows of no previous cure, however. Splenectomy gives the best results.

123 East Ninety-Fifth Street.

TESTS BY BÁRÁNY METHODS

DEMONSTRATING NEURAXIAL DIFFERENTIATION OF THE FIBERS FROM THE HORIZONTAL AND THE FIBERS FROM THE VERTICAL SEMICIRCULAR CANALS *

CHARLES K. MILLS, M.D.
Neurologist, Philadelphia General Hospital; Emeritus Professor of Neurology, University of Pennsylvania School of Medicine
AND
ISAAC H. JONES, M.D.
Instructor in Neuro-Otology, University of Pennsylvania School of Medicine; Laryngologist, Philadelphia General Hospital
PHILADELPHIA

While contributions which add something to our previous store of knowledge need no excuse for their presentation, nevertheless in deference to the tendency of many to query as to the so-called practical values, it is worth while sometimes to indicate what service to medicine may be the outcome of a somewhat intricate clinicopathologic study. Researches by the Bárány methods, especially when these were complemented by necropsies with microscopic investigation, have furnished facts of importance in diagnostic symptomatology. First, the cause of vertigo, that symptom which so frequently confronts not only the neurologist and otologist, but also physicians at large, is often a perplexing problem. No matter where the primary seat of the affection which causes vertigo may be situated, whether in the stomach, kidney, liver, pancreas, tonsils, or the brain outside of the vestibular apparatus, the resulting toxemia, the abnormal nervous stimulus, or the cardiovascular disorder does not produce vertigo until the vestibular apparatus — the labyrinth and its associated pathways and encephalic centers — is involved. The Bárány tests furnish us with the means for studying this vestibular apparatus. Secondly, these tests enable us to say with more positiveness that an intracranial tumor, abscess or other lesion is situated in the third ventricle or in the cerebellopontile angle, is limited to the pons or the cerebellum or is labyrinthine.

Cajal has shown histologically that fibers from the vestibular portion of the eighth nerve enter Deiter's nucleus and continue from the inferior cerebellar peduncle into the cerebellum itself. This tract has been generally recognized and accepted. We believe that (1) this path includes the fibers from the horizontal semicircular canals exclusively, and (2) the fibers from the vertical canals have an entirely different course. The former are confined to the oblongata, while the latter ascend into the pons.

In thirty-two cases in which the labyrinths themselves and the eighth nerves were normal and the horizontal canals gave normal reactions, the vertical canals failed in some or all of the well known responses. That the labyrinths themselves were normal was made probable by the presence of perfect hearing, and corroborative evidence of neuraxial lesions was additional confirmation. In five cases stimulation of the vertical canals produced no nystagmus, no vertigo, no past pointing and no falling, and yet violent projectile vomiting occurred. This showed that the vertical canals themselves were functionating; in fact, there was even a hyperactive response of the tenth nucleus to the stimulation of the canals. In one case in which the lesion was clearly thrombosis of the right posterior inferior cerebellar artery, the right horizontal canal failed to respond normally, whereas reactions from the right vertical canals were normal.

REPORT OF CASE

History.—C. M. D., a woman, aged 36, admitted to the University Hospital to the service of Drs. Mills and Spiller, Aug. 12, 1915, having been referred by Drs. S. D. Ludlum and J. W. McConnell, gave a history of vertigo, without associated tinnitus, of eight weeks' standing. Two weeks after the onset vertigo was so marked that she was not able to walk. She staggered both to the right and to the left. At this time she began vomiting without precedent nausea, and continued to do so at intervals until her death, two weeks after her admission.

The fourth week of her illness the patient noticed that the right limbs were becoming weak. This impairment increased until at the time of admission she could scarcely move either the right arm or leg. Five weeks from the time of onset she began to have severe headaches. In the sixth week she noticed that her sight was becoming bad, and grew steadily worse. The family history was negative except that one uncle had had a brain tumor.

Examination.—The following notes were made immediately after the admission of the patient:

The right eye shows slight ptosis, some weakness of the external rectus, of the superior and inferior obliques and internal rectus. The left eye shows ptosis and weakness in all ocular movements. Movements of the musculature of the third nerve are almost completely abolished. Conjugate movements are lost in all directions. The pupils are unequal, the right being larger. They react to direct stimulation, but the convergence response is questionable. Dr. B. Baer reports marked papilledema, worse in the left eye.

The patient lies in bed in the supine position with the head slightly inclined to the left. She has a typical right-sided hemiplegia, face, arm and leg, with moderate hypertonicity. Superficial and deep reflexes are all increased. Foot clonus is absent. Plantar stimulation gives plantar flexion. No paralysis is discoverable in the left half of the body, but the left finger-to-nose test shows a distinct ataxia, the uncertainty being of small excursion. Sensation for pain and touch is everywhere normal. Speech is slow and dysarthric, but not sufficiently so to make it inarticulate. The patient answers questions sensibly and performs commands so far as she is physically able. The blood examination is normal.

The patient died suddenly just ten weeks after the onset of her illness.

Before giving the results of the ear tests, it might be well to recall a few well known facts regarding them. The semicircular canals may be stimulated by turning an individual in a smoothly revolving chair, or by douching the ear with either hot or cold water. When the individual is turned with the head in the upright

11. Jona, G.: Policlinico, Rome, 1916, xxiii, No. 1; abstr., THE JOURNAL A. M. A., Feb. 26, 1916, p. 696.

* Read before the American Neurological Association, Washington, D. C., May 8, 1916.

position, the horizontal canals are stimulated. When he is turned with the head forward or backward, the vertical canals are stimulated. Naturally the turning involves the labyrinths of both sides. Douching, on the other hand, influences only one ear. Douching the ear with the head upright stimulates the vertical canals, whereas douching with the head either forward or backward stimulates the horizontal canal.

Tests.—On looking to the right, this patient showed a marked horizontal nystagmus to the right. On looking to the left, there was a horizontal nystagmus to the left not so marked. Looking upward produced occasional vertical nystagmus upward.

Turning to the right, with head upright, produced a rotary nystagmus to the left, instead of the normal horizontal. The remarkable feature of this turning was that the nystagmus lasted thirty-four seconds, which is unusually long as compared with the normal twenty-six, and yet no vertigo was produced. That there was any nystagmus at all is remarkable, because turning to the left produced no nystagmus, but a *conjugate deviation* to the left. Turning to the left also failed to produce vertigo.

Douching the right vertical canals gave no reactions. Douching the right horizontal canal caused a conjugate deviation to the right. This became a fairly good horizontal nystagmus to the left when the patient was told to look straight ahead, or to the left.

Douching the left vertical canals gave a similar reaction, namely, after the normal length of time (forty seconds) there was a marked conjugate deviation to the left, with a developed oscillatory nystagmus to the right, when the patient made the effort to look to the right.

Douching the left horizontal canal caused conjugate deviation to the left after thirty seconds, which became an irregular horizontal nystagmus to the right when the patient was told to look to the right, and there were irregular twitches for a while which settled back again into a conjugate deviation to the left.

Stimulation of the right horizontal and the left vertical canals produced no vertigo. Considerable dizziness, however, resulted from stimulation of the left vertical canals.

Incidentally, the following difficulties were encountered in examining this patient: Her mentality was poor, her speech was difficult to understand, and the pointing tests were impossible because of paralysis of the right upper extremity, and marked incoordination of the left upper extremity.

Dr. Jones reported in writing to Drs. Ludlum and McConnell: "The results of the Bárány tests indicate a lesion of the upper portion of the pons and the junction of the cerebral crura at the point where the cerebral fibers reach the region of the posterior longitudinal bundle. The oblongata and lower half of the pons appear uninvolved."

Dr. William G. Spiller makes the following report of his macroscopic and microscopic examination:

"The tumor extends from the uppermost portion of the cerebral peduncles, through the pons, and into the cerebellar lobe. It is confined to the left half of the brain stem throughout. It causes much enlargement of the left side of the cerebral peduncles, and implicates almost all of this side. In the upper part of the pons the posterior longitudinal bundle on the right side is well preserved, but the outer portion of the posterior longitudinal bundle on the left side is much degenerated. The tumor in the upper part of the pons is confined to the left tegmentum, and implicates almost all of this portion of the tegmentum. The same is true of the middle portion of the pons. The tumor greatly compresses the fourth ventricle, and almost closes it by displacement of the surrounding tissue. It does not invade the medulla oblongata, but at the level of this structure it is confined to the white matter of the left cerebellar lobe. It is a glioma."

COMMENT

A study of the data obtained by the ear tests and necropsy indicates certain definite facts as to the vestibular pathways in the neuraxis. The experiments demonstrated that the tracts from all the semicircular canals except the right verticals, through the vestibular nuclei to the nuclei of the ocular nerves were open. The specimen showed that the Deiters' nucleus group (Deiters' nucleus proper, the triangular nucleus and von Bechterew's nucleus) was unaffected by the lesion, as were also the entire oblongata and the lower part of the pons.

Let us recall the peculiar response of conjugate deviation. This ocular movement may be regarded as the slow component of nystagmus. For it to occur it is only necessary that the stimuli shall pass from the ear through the posterior longitudinal bundle to the nuclei of the sixth nerve and of the third nerve, or rather of that part of this nerve which innervates the internal rectus. The conjugate deviation, therefore, results from stimulation of the ear; but this normally is converted into a nystagmus by impulses from the cerebrum which tend to call the eye back to its usual position, that is, if the cerebro-oculonuclear tracts are open. It follows, therefore, that if, as in this case, the response is only a conjugate deviation, some lesion is interfering with the transmission of cerebral stimuli to the nuclei of the ocular nerves affected. It has been shown by necropsy that such a lesion was present.

It may be of interest to note in this connection that one fully anesthetized, when the semicircular canals are stimulated, shows only a conjugate deviation and no return movement.

Let us turn now to an explanation of the vertigo in the light of our premortem and postmortem findings. We believe that the ear stimulus which produces vertigo passes to the cerebrum through the *cerebellum*. While the paths which carry the vestibular stimuli through the cerebellum to the cerebrum are not demonstrated absolutely in all their extent, the facts at our disposal appear to indicate that they are received by the cerebellum through the inferior cerebellar peduncle from the horizontal canals and the middle cerebellar peduncle from the vertical canals, and after completing their cerebellar itinerary, pass to the cerebrum by way of the superior cerebellar peduncles. In the present case ear stimulation failed to produce the normal vertigo from all the semicircular canals except the left verticals. Clearly, therefore, there was obstruction somewhere in this vestibulocerebellocerebral pathway concerned with the stimuli causing vertigo. As there was present a conjugate deviation from the stimulation of the same canals or tracts, the lower neuraxial pathways appeared open. To explain this absence of vertigo the logical place of destruction was at the decussation of the superior cerebellar peduncles. The necropsy studies showed involvement of the superior cerebellar peduncles, which have been demonstrated to contain tracts which pass to the cerebrum from the cerebellum.

With regard to the spontaneous nystagmus upward, this case confirms our previous experience that such a nystagmus is pathognomonic of a neuraxial lesion, either destructive or due to pressure.

The right vertical canals failed to produce any reactions. It follows, therefore, that the neuraxial fibers from these canals were involved, and as the lesion was in the upper portion of the pons, that these fibers must reach at least as high as the site of this lesion. That the lesion extended further down on the left side suggests that the fibers from the right vertical canals decussate to the opposite side.

In our experience, interruption of the impulses from the vertical canals is produced by tumors of the cerebellopontile angle, internal hydrocephalus causing pressure on the floor of the fourth ventricle, and intracerebellar tumors causing pressure on the pons.

Finally, we are confident that the fibers from the horizontal canal and the fibers from the vertical canals have separate pathways in the neuraxis. That the horizontal canal fibers are confined to the oblongata and enter the cerebellum through the inferior peduncle and that the vertical canal fibers ascend into the pons and enter the cerebellum through the middle peduncle, however, we believe to be highly probable, but feel that our evidence to date is not sufficiently large to indicate with confidence the exact course of these fibers.

THROMBOSIS OF BRACHIAL ARTERY

RELIEVED BY INCISION AND MASSAGE OF THE ARTERY

JOHN A. CALDWELL, B.S., M.D.
Fellow of the American College of Surgeons; Junior Surgeon, Cincinnati General Hospital
CINCINNATI

Jan. 17, 1912, the patient, a street car conductor, was on the rear platform of a standing car, when suddenly the building in front of which his car was standing was demolished by a natural gas explosion. A shutter was hurled by the explosion, and struck him on the flexor side of the left arm, above the elbow. He also received minor cuts and bruises about the face and lost consciousness.

On regaining consciousness, his left hand felt numb and was cold. When I saw him about a half hour later, it was quite evident he had suffered considerable psychic shock. He was pale, cold and covered with clammy perspiration. Examination of the left arm revealed considerable ecchymosis on the inner side of the arm just above the elbow. The skin was tense, but not pulsating. The fingers were cold, and most careful examination failed to disclose any pulsation in the radial artery.

The patient was sent home, the arm wrapped in cotton and hot water bottles were applied. After three hours, another observation of the arm showed no improvement. The numbness seemed worse, and the hand was still cold and pulseless. The patient was then sent to a hospital.

I supposed at that time I was dealing with a thrombus; consequently, my purpose was to expose the artery, locate the lesion, clamp the artery above and do a thrombectomy. By a 3-inch incision just above the elbow to the inner side of the biceps, the brachial artery was exposed to touch without difficulty, and at a certain point (I would judge about 2 inches above the bifurcation), good distensile pulsation could be felt. Tracing the artery downward from this point was easily done, and the impact on the artery was felt with each pulsation, but the artery did not alternately dilate and contract. It was evident that here was a thrombus.

Beginning at the most distal point on the artery within reach of my finger, I firmly stroked the vessel proximally. After three or four strokes, the intern who had held his finger constantly over the radial suddenly announced that good pulsation had returned. After waiting for several minutes to see if the radial pulse was maintained, and noting that there was no change in its vigor, I closed the wound.

On the following morning both radials beat with equal tension, all numbness was gone and the hand was warm. From this time recovery was uneventful.

Evidently I broke up a clot which was carried further on. In the forearm the collateral circulation is so free that the complete occlusion of either radial or ulnar offers practically no barrier to good nourishment of the hand.

In the past few years, surgery of the arteries has made such advances that one is no longer justified in regarding a damaged artery as a *noli me tangere*. In this case the dislodgment of the clot and reestablishment of the radial pulse rendered further interference unjustifiable. If the clot had not been dislodged, my purpose was to make a clean incision in the brachial and remove it.

Evidently the syncope following the accident with its consequent low blood pressure and a slight damage to the intima formed a combination of conditions favorable to thrombosis. I infer that the damage to the intima must have been very slight for, in the presence of any considerable alteration of the intima, thrombectomy has succeeded in restoring the circulation only temporarily. This patient has now been perfectly well for more than four years.

My object in reporting this case is to emphasize the necessity of prompt action in the operative relief of thrombosis. After a thrombus has lodged long enough to cause changes in the intima, its removal will only result in another thrombosis. Of course, massage of an artery and breaking up of a clot in a location where small emboli would be carried on and might cause damage would be inexcusable. In this case, however, either the clot was dissolved, or it obstructed such small vessels that it offered no barrier to complete collateral circulation.

350 Ludlow Avenue.

THE COMPARATIVE RESISTANCE OF BACTERIA AND HUMAN TISSUES TO CERTAIN GERMICIDAL SUBSTANCES *

ROBERT A. LAMBERT, M.D.
NEW YORK

It is recognized that an ideal germicide for use on infected tissues of the body is one that will kill the pathogenic micro-organisms present without at the same time injuring the tissues.

Although clinical observations have led to fairly definite conclusions regarding the irritating or nonirritating qualities of many germicides, it is obviously not practicable to carry out on the living body—in human beings, at least—experiments to determine accurately the relative resistance of tissues and bacteria to chemicals of any kind.

It is hardly necessary to state in this connection that the irritative action of any germicide is dependent on the injury to the cells which it causes.

Since in the growth of tissues in vitro by the method of Harrison, Burrows and Carrel we have, as regards cell life, conditions closely analogous to those in the body, it occurred to me that this technic might be utilized for investigating the problem, just suggested, of finding an ideal germicide.

In carrying out this idea, the method has consisted in subjecting infected and noninfected tissues removed from the body to the action of various chemicals, including most of the germicides in common use. The relative resistance of bacteria and cells was determined by incubating the treated tissues in tissue culture preparations. In the clotted plasma both cells and bacteria which survived exposure found a suitable medium for growth. In such experiments cells and bacteria

* From the Pathological Laboratory of the Presbyterian Hospital.

are exposed under practically the same conditions as obtain in an infected wound bathed in an antiseptic solution. Staphylococcus aureus was the organism used. Human tissues were used throughout the experiments, since it seemed that the results would be of more practical value than if the tissues of lower animals were employed.

It was shown in a previous paper[1] that by the use of a slightly modified plasma medium human connective tissue cells and wandering cells (such as, for example, in lymph glands and spleen) can be cultivated as easily as similar cells of lower animals.

A more detailed report of the technic of these experiments will be published elsewhere.

The accompanying table gives the results obtained so far in testing some of the commoner germicides.

It is seen that cells are more easily destroyed than bacteria by all but one (iodin) of the agents used. However, in the case of several—mercuric chlorid, sodium hypochlorite (Dakin's solution), potassomercuric iodid, argyrol and phenol—the difference is not great. That normal cells should exhibit even this demonstrated degree of hardihood will probably occasion some surprise. It is interesting, for example, that

TESTS OF SOME COMMON GERMICIDES

	Cells Not Killed by	Bacteria Not Killed by	Cells Killed by	Bacteria Killed by
Mercuric chlorid	1:120 000	1:80,000	1:80,000	1:40,000
Potassomercuric iodid	1:20,000	1:10,000	1:10,000	1:5,000
Potassium cyanid	1:6,000	1:3,000	1:4,000	1:500
Sodium hypochlorite*	1:10,000	1:5,000	1:2,000	1:1,000
Iodin	1:2,500	1:5,000	1:1,250	1:2,000
Phenol	1:500	1:200	1:200	1:100
Trieresol	1:2,000	1:500	1:1,000	1:200
Argyrol	1:400	1:250	1:200	1:100
Hydrogen peroxid†	1:1,500	1:200	1:1,000	1:50
Alcohol	1:10	1:5	1:5	1:1

* The sodium hypochlorite solution was prepared according to the method recently described by Dakin (Brit. Med. Jour., 1915, ii, 318), who also states that the solution contains a definite calculable amount of hypochlorite (from 0.5 to 0.6 per cent.) and that it is free from the harmful impurities in the solutions prepared in the usual way. Very favorable results are reported by Carrel and others from the use of the solution on wounds treated in the French military hospitals.

† The U. S. P. 3 per cent. solution was used. The figures indicate the actual amount of hydrogen peroxid present.

no harmful effect whatever was seen from exposure of cells for one hour to 10 per cent. alcohol. The low bactericidal power of hydrogen peroxid, so popular among the laity, is noteworthy.

Iodin, as indicated above, stands out as the one germicide toward which cells were found to be more resistant than bacteria. The difference was not striking, but it was possible by the use of a solution of iodin of suitable strength to kill the organisms in infected tissues without affecting more than slightly the growth of cells.

Since the ultimate aim in this work was to find an ideal tissue disinfectant, it should be mentioned that iodin, as well as the sodium hypochlorite solution used, possesses the power of rapidly dissolving fibrin—a property which may militate against the use of either of these germicides in healing wounds; for it is recognized that fibrin serves a useful purpose in plastering together wound surfaces, thus facilitating organization, and in forming on the base of an ulcer or other granulating surface a scaffolding on which fibroblasts and sprouting blood vessels may cling.

It has been concluded from these experiments that the method of tissue cultures affords a simple, direct, and easily controlled method of determining, under conditions analogous to those in the body, the relative resistance of tissues and bacteria to various chemical agents, including the common germicides. Of the germicides tested, iodin is the only one which will kill staphylococci in strengths which do not seriously injure tissue cells. It is possible, however, that on account of the fibrin-dissolving property of iodin, causing conceivably an inhibition of wound healing, some other substance may be found approaching more closely the ideal tissue disinfectant.

1. Lambert, R. A.: Jour. Exper. Med., 1916, xxiv.

New Instruments and Suggestions

NOTE ON AN AUSCULTATORY SIGN OVER THE MANUBRIUM

LOUIS M. WARFIELD, A.B., M.D., MILWAUKEE, WIS.

In the routine examination of patients, a sign was found on auscultation with the stethoscope on the manubrium which seems to be of some importance, and which is not found described, or is found only casually mentioned, in any books on physical diagnosis which have been consulted. For over a year now this sign has been noted, and has been helpful in determining whether or not the anterior mediastinum was free from encroachments of any kind, organs or swellings or actual tumor masses.

In the normal subject, the anterior borders of the lungs practically unite in the median line beneath the manubrium. They cover the trachea and the large arteries and veins which pass through the anterior mediastinum. The true space is normally only a potential space filled with loose areolae tissue in which are lymph spaces. In the infant the thymus occupies this space in its whole extent, but in the adult this gland is so small that it is often not possible to find even traces of it. The posterior part of the space is bounded by the trachea, which lies at a variable depth from the manubrium, depending on the size and shape of the chest. It may be from 4 to 6 cm. from the manubrium.

These being the anatomic relations, it is not possible with the most accurate percussion to detect any change in the note from that of the lung at either side of the manubrium. Also, and this is the important point, auscultation over the body of the manubrium gives a vesicular murmur, or, at the most, the slightly bronchovesicular character which is usually found over the right upper front just below the clavicle.

It has been found that any solid or semisolid (edema) mass in the anterior mediastinum changes the respiratory sound from the vesicular to harsh bronchial, and finally to typical high-pitched tubular breath sounds.

The cause for this phenomenon is considered to be the interposition of a sound-conducting substance between the trachea and the bone. I have found this sign most useful and helpful in cases of dilated arch of the aorta, and in cases of Hodgkin's disease when the mediastinum contains enlarged glands. At a time when careful percussion reveals no impairment of the note, the breath sounds will certainly be bronchial and may be typical tubular. In one particularly instructive case of Hodgkin's disease, the sign over the manubrium was typical. At operation the surgeon succeeded in removing the mass of glands below the upper portion of the manubrium. Auscultation now revealed only a slight prolongation of the expiration over the upper two thirds of the manubrium (edema?), but tubular breathing over the lower third.

Tubular or bronchial breathing has been found in: (1) persistent thymus; (2) substernal thyroid enlargement; (3) edema of mediastinal tissues; (4) enlarged glands; (5) aneurysm; (6) dilated aortic arch: (*a*) acute aortitis, and (*b*) chronic dilatation, and (7) tumor growths.

I have been particularly interested in cases of enlarged glands and those with dilated aortic arches. Thus far all cases in which the sign has been present have been shown by roentgenograms or by fluoroscopy to have had the condi-

tion diagnosed with the stethoscope. It is stated in some textbooks on medicine that in aneurysm of the arch the breath sounds over the manubrium are not very audible. This, I feel sure, is incorrect. The error is due to the fact that the loud sounds produced by the closing of the valves of the heart, or by murmurs in the aneurysmal sac, so obscure the respiratory sounds that unless one listens particularly for these sounds he will certainly fail to hear them. As a matter of fact, in all the cases of aneurysm during the past year I have heard this sign, and in two instances tubular breathing beneath the manubrium drew attention to the diagnosis of otherwise obscure cases. It is hoped that others will use this sign and obtain as much help from its presence as I and my assistants have obtained.

79 Wisconsin Street.

A METHOD WHICH GREATLY FACILITATES THE CULTURE OF THE MENINGOCOCCUS*

M. B. COHEN, M.D., AND LOUIS MARKLE, B.S., M.D.
Resident in Pathology, and Assistant Resident, respectively, Cincinnati General Hospital
CINCINNATI

The difficulty in isolating some strains of the meningococcus is appreciated by those who have worked with this organism. Primary cultures of some strains are easily obtained on human blood agar or Loeffler's blood serum, but others, resembling the gonococcus very closely, will grow only on ascites or pleuritic agar. Often only one or two colonies are obtained in cultures when many diplococci are demonstrated in control smears. Wherry and Oliver,[1] working with the gonococcus, found that thousands of colonies could be produced by growth at partial oxygen tension when control aerobic tubes remained sterile or showed only a few colonies.

Because of the close relationship of the gram-negative diplococci to one another, it was thought that this method of growth at partial tension might facilitate the culture of the meningococcus. Accordingly aerobic partial tension and anaerobic cultures were made of the spinal fluid in a case of epidemic cerebrospinal meningitis on a medium composed of equal parts of the basic sodium phosphate agar described by Martin,[2] and sterile pleuritic fluid. All tubes were incubated at 37.5 C. For the anaerobic cultures the pyrogallic acid method was used. The partial tension cultures were made by connecting the culture tube to a freshly inoculated agar slant of *B. subtilis* by means of rubber tubing.

An average of two colonies appeared on each aerobic tube in twenty-four hours, while hundreds appeared on those grown at partial tension; the anaerobic cultures remained sterile and were discarded after six days. Transplants from the partial tension strains would grow aerobically on the same medium but not nearly so luxuriantly as at partial tension. No growth could be obtained aerobically on human or rabbit's blood agar or on Loeffler's blood serum; a scanty growth was produced at partial oxygen tension on human blood agar.

The fermentation reactions of both the aerobic and partial tension strains were tested, glucose, levulose, saccharose, mannite, maltose, lactose and galactose being used with Martin's pleuritic agar as a base. Slight acidity was produced in glucose and maltose in twenty-four hours by the partial tension strain and in thirty-six hours by the aerobic one. The remaining sugars were unchanged at the end of six days and were discarded. These results correspond with the aerobic fermentation reactions of the meningococcus as described by Martin.[2] In fermentation tubes in a medium made of equal parts of sugar broths and pleuritic fluid, only glucose was fermented, with the production of a slight amount of acid.

Primary partial tension cultures were obtained from six other specimens of spinal fluid in the same case and from eight specimens in another case. Growth at ordinary oxygen tension yielded meningococci only four times, and in each instance the growth was meager. In the majority of instances cultures were obtained when no diplococci could be found microscopically in control smears. Both of these patients recovered after intraspinal injections of antimeningococcic serum; neither patient had any clinical evidences of gonorrhea. These facts, together with the fermentation reactions, are sufficient proof of the identity of the organism.

Since the strains of the meningococcus isolated in these cases grew best at partial oxygen tension and scarcely at all aerobically, it is evident that many of the organisms are micro-aerophils and only a few are capable of growth at ordinary oxygen tension.

In view of these facts, it seems to us that for the cultivation of the meningococcus, growth at partial oxygen tension, preferably on Martin's pleuritic agar, should be adopted as a routine.

* From the Pathologic Institute of the Cincinnati General Hospital, and the Department of Pathology of the University of Cincinnati.

1. Wherry, W. B., and Oliver, W. W.: Lancet-Clinic, Cincinnati, 1916, cxv, 306.
2. Martin, W. B. M.: Jour. Path. and Bacteriol., 1911, xv, 76.

Therapeutics

ILLUMINATING GAS POISONING

ETIOLOGY

Poisoning by illuminating gas is not uncommon. Most of the cases are due to suicidal intent and are produced either by the gas escaping through an open jet, or by means of a tube attachment to the mouth (the person breathing the gas by way of the mouth). At other times poisoning may be accidental, owing to the unintentional opening of a stop cock, or it may result from a leak in some part of the piping. Poisoning has occurred in houses which are in the vicinity of a broken main from which gas escapes, and workmen seeking to repair such leaks have themselves often been overcome. Poisoning may also occur in carelessly conducted illuminating gas plants, where a leak in the system allows enough gas to escape so that the surrounding atmosphere becomes filled with it.

PATHOLOGY

In illuminating gas poisoning, the symptoms are due to the carbon monoxid contained in the gas. The amount of carbon monoxid in the air need not be great to produce symptoms of poisoning. When air contains from 1 to 2 per cent. of this gas, inhalations can cause serious symptoms. When the content in the air rises to as high as from 10 to 20 per cent., persons exposed can survive only a short time, and if death does occur, as much as from 60 to 80 per cent. of the hemoglobin in the circulation will be in combination with the carbon monoxid. Even when there is as little as from 0.07 to 0.12 per cent., breathing in this atmosphere for half an hour will render one quarter of the red blood corpuscles incapable of uniting with the oxygen.

After inhalation of carbon monoxid, it enters the blood stream and there unites with the hemoglobin, forming a compound called carboxyhemoglobin. This gives a bright red or cherry red color to the blood. The combination is a stable one and cannot be easily disturbed by the presence of oxygen unless the oxygen is present in large amount and under pressure, in which case the oxygen may drive off some of the carbon monoxid, replacing it. It is on account of this close union of the carbon monoxid with the blood that there results insufficient oxygenation, and the symptoms resulting are due partly to the toxic action of the

carbon monoxid and partly to air hunger. Blood containing carbon monoxid has a characteristic appearance when observed by means of the spectroscope, and this means is used to detect its presence in the blood.

Carbon monoxid has a direct action on the nervous system, first stimulating the central nervous system and then depressing it, with a resultant paralysis. The order in which the parts are affected are the brain, spinal cord and medulla. Besides this, it also attacks other tissues, such as the muscles and glands, and produces in these very rapidly a considerable amount of degenerative changes that sometimes result in gangrene. The attack of the gas is so insidious that often before a person becomes aware of its presence there exists a certain amount of mental depression, if not stupor. This is particularly true when the gas is inhaled during sleep. Escaping gas is almost always detected by its odor when one is awake.

SYMPTOMS

McCombs,[1] who has observed 1,000 cases of illuminating gas poisoning, has grouped the symptoms resulting from the poisoning into three stages, which in a general way may be divided as follows: The first stage continues until the patient loses consciousness; the second stage, beginning with syncope, ends with apnea; in the third stage the patient is comatose, and respirations have ceased.

In most cases, the first symptoms consist of a feeling of discomfort and a throbbing of the blood vessels. There is also dizziness, headache, weakness, and sometimes nausea and vomiting. Pains in the extremities have occurred, and also muscular twitching. The temperature remains normal. The pulse becomes full and bounding, and there is a rise in the blood pressure. The beginning difficulty in breathing is felt as a constriction around the chest. The pupils are widely dilated, and there is a gradual sinking into stupor and finally into unconsciousness. As this continues, the respiration is accelerated and stertorous, the skin becoming dusky and the lips and extremities blue. This is due to the advancing asphyxia. At this time also the temperature may begin to rise. On account of the action of the gas on the cortical centers, the control over the reflexes is lost. There may even be a loss in the control of the sphincters. Tetaniform convulsions may occur at this stage, and this will ultimately be replaced by a marked muscular rigidity in which the jaws also may become rigid. The pulse and the respirations both become weaker, and finally there is apnea. If the gas is still being inhaled, the poisoning continues, and there occurs sooner or later complete cessation of the heart action as well as of the respiration. A characteristic change is the bright red color of the blood, which is also seen as cherry-red markings of the skin, lasting for some time after death.

As a rule, convalescence is tardy, and there may result symptoms of a pulmonary or nervous character. Loss of memory has also resulted. Most of the after-symptoms are referable to the nervous system, and consist of delirium, transient hemiplegia, nervousness, insomnia, various neuralgias, and also glycosuria. Complications such as bronchopneumonia have also occurred. If the patient survives, all complications usually clear up.

1. McCombs: Am. Jour. Med. Sc., October, 1912, p. 577.

TREATMENT

Success in the treatment will depend on how quickly and how thoroughly the carbon monoxid can be removed. It also depends on how saturated the blood is with carbon monoxid. First, it is usual to resort to artificial respiration with simultaneous stimulation of the heart. The artificial stimulation may be either by means of the Silvester or Schäfer methods, or it may be carried out by mechanical respiratory devices which force air into the lungs. Artificial respiration by intratracheal insufflation through a tube inserted into the trachea, as suggested by Meltzer,[2] can also be used.

For stimulation, hypodermic injections of strychnin or camphor in oil may be given; strophanthin may be given; strong coffee may be given by the mouth if the patient is not totally unconscious. Physiologic saline solutions may be injected into the rectum by the drip method, or from 300 to 500 c.c. may be given every three hours subcutaneously into the breast. Other substances that can be tried are hypodermic injections of 2 c.c. of ether, $\frac{1}{100}$ grain of atropin, or 2 minims of epinephrin solution (1:1,000). The body, especially the feet, should be kept warm.

If by these means recovery does not take place, or only very slowly, other measures may be resorted to. One of these is venesection with the introduction of an amount of physiologic saline solution corresponding to the amount of blood removed.

PROGNOSIS

McCombs[1] states that if treatment is resorted to before the appearance of the usual signs of death, almost all patients should recover from the immediate effects of the gas in from forty-eight to seventy-two hours. He also cites Edsall, who reported the recovery of thirty-four patients in thirty-nine poisonings, the fatalities resulting from sequelae of the poisoning.

2. Meltzer, S. J.: Pharyngeal Insufflation, A Simple Method of Artificial Respiration, THE JOURNAL A. M. A., May 11, 1912, p. 1413.

Epidemiology of Typhus During the Last Few Years.—A recent compilation published by the International Public Health Bureau at Paris shows that a few scattered cases of typhus have been recorded in nearly every country each year for many years. The war has brought a recrudescence at the same time that medical science has shown how to prevent its ravages. The principal focus of endemic typhus in Europe outside of Russia is Galicia; next comes Poland, and the disease is endemic also in certain parts of the Balkans and Turkey in Asia. There are also typhus victims each year in Persia, northern China and Siberia, and cases have been known in Japan. In England and Wales there were over 23,000 deaths from typhus between 1869 and 1883; 2,249 from 1884 to 1898, and only 390 since then to the end of 1913. France from 1903 to 1913 had a total of 209 deaths from typhus; the seacoast provinces suffered most. The Scandinavian countries seem to have escaped most. In the recent epidemic in Serbia it is estimated that 135,000 persons died from typhus. In Russia the deaths from typhus between 1905 and 1911 ranged each year from 3,639 to 10,500, but there were comparatively very few cases at Moscow and Petrograd. In northern Africa the disease always has a foothold but rarely becomes epidemic. Egypt has from one to two thousand deaths annually but during the first half of 1915 there were 14,505 cases reported with 3,398 deaths. It was at Tunis that attention was first attracted to the louse as the possible conveyor of the disease, confirmed by our own investigators in Mexico, our American endemic focus. The records show a total of 56,719 cases and 14,758 deaths in Mexico from 1893 to the end of 1913.

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SATURDAY, OCTOBER 28, 1916

THE TREATMENT OF WAR WOUNDS

The fluctuations of surgical opinion concerning the treatment of war wounds have been noted in THE JOURNAL from time to time in the letters from foreign correspondents and in other departments. At the beginning of the war a general opinion prevailed, and was acted on, that the special conditions of war wounds called for the energetic use of strong antiseptics according to the listerian technic. It is notorious that the results were unsatisfactory. Two other methods have since come into favor, one the Dakin-Carrel method, employing hypochlorites, and the other the Wright or so-called physiologic method.

A series of articles appeared by Sir Almroth Wright.[1] In these he explained his method and gave the experimental basis for it. A vigorous reply from Sir Watson Cheyne,[2] formerly Lister's assistant and now president of the Royal College of Surgeons, followed in another publication. Practically Sir Watson Cheyne seems to have constituted himself the uncompromising champion of the so-called listerian method. According to Sir Watson Cheyne the unfavorable results which were given by this method in the early part of the war were due to defective technic. He states that the improved technic devised by himself and other members of the commission *ad hoc* did give in some hands excellent results, and would have given them more generally but for the fact that justice was not done in the official trials, owing to the prejudice entertained by the surgeons. He intimated that discipline alone prevents the thousands of surgeons who have been using the Wright method from expressing their dissatisfaction. Later,[3] Wright gave an explanation of further development of his method, but this article was not a reply to Sir Watson Cheyne's attack on the method. The reply came, however, none the less vigorous for the delay.[4] Wright divides his answer into two parts. The first is a contribution to the ethics of polemic controversy, the main thesis of which is that truth must be learned at all hazards, even at the risk of personal offense to parties in the controversy. Having thus explained himself, Sir Almroth takes up the second part, in which he applies this principle and proceeds to berate Sir Watson generally. He does not, of course, attack the president of the Royal College of Surgeons in his private capacity, but only in his scientific life, the methods of thought and action as illustrated in the article published in the *British Journal of Surgery*.

All who have had to do with the treatment of wounds during the present war are emphatic in declaring that they differ in important respects from what is customary in the lesions encountered in civil practice. Indeed, surgeons with experience of previous wars have found that wounds in this war have features peculiar to themselves. Sir Watson Cheyne, however, speaks of war wounds as though they were fairly comparable with such compound fractures as occur in civil life. This is not the view of the majority of the writers on the subject, and it seems to be the strength of Wright's[5] position that war wounds are invariably infected; that in only rare cases does the wounded man present himself for adequate treatment within a short time of the infliction of his wound; that highly infected foreign bodies are usually found in all complicated war wounds; that the latter are not open wounds accessible to swabbing with strong antiseptics (remember that Sir Watson Cheyne wants to recommend pure phenol [carbolic acid]), and can only rarely be converted into open wounds; that in such a wound it is not its cavity or limiting surface, but the interior of the adjacent tissue which is important as regards infection, and that no strong antiseptic has ever been shown to penetrate a useful distance into the walls of the wound, although, of course, such antiseptics may be absorbed by the vascular system and thereby give evidence of their presence in the systemic circulation.

Wright's method consists essentially of irrigating the wound first with hypertonic salt solution and then, at the appropriate moment, with isotonic saline solution. Vaccines may be used as adjuvants. Finally the wound is closed. The rationale of this method is that hypertonic saline solution checks microbial growth, and causes a mechanical cleansing of the wound and of the depths of its walls by the lymph exuded, while inhibiting the tryptic action of the exudate. The isotonic saline solution permits and encourages phagocytosis and tryptic digestion of clots and other solid exudates.

In the Dakin-Carrel technic, a modification of Labarraque's hypochlorite solution is kept flowing continuously or nearly continuously in contact with the wound, in the belief that thereby antisepsis or even disinfection can be combined with mechanical cleans-

1. Wright, A. E.: Wound Infections and Their Treatment, Lancet, London, 1915, ii, 957, 1009, 1063.
2. Cheyne, W. W.: Treatment of Wounds in War, Brit. Jour. Surg., January, 1916.
3. Wright, A. E.: Treatment of Infected Wounds by Physiologic Methods, Lancet, London, 1916, i, 1203.
4. Wright, A. E.: The Question as to how Septic War Wounds Should Be Treated, Lancet, London, Sept. 16, 1916.
5. Wright, A. E. (Footnotes 3 and 4).

ing. Toward this method both extremists extend a hand much in the familiar way of belligerents courting neutrals. Sir Watson Cheyne welcomes the hypochlorites as antiseptics and germicides which he hopes will prolong the useful period for the employment of such agents. Sir Almroth Wright, while not conceding their value as antiseptics in septic wounds and still less as disinfectants, sees in them constituents of an irrigating fluid far less objectionable than the ordinary antiseptics, if only because they are devoid of the antienzymic properties of the latter. It is well here to draw attention to the fact that the antiseptic action of the hypochlorites in wounds has been strongly challenged by others than the thick-and-thin adherents of Sir Almroth Wright, and their disinfecting action is denied by a much larger number. It must be borne in mind that the action of an antiseptic in a wound is difficult to measure in nonexperimental conditions. The mere fact of obtaining a positive result by culture, showing the presence of living bacteria, is of no significance, and strictly comparable quantitative results are difficult to obtain by direct examination of smears.

THE INCUBATION PERIOD IN INFECTIOUS DISEASE

The "incubation period" is the expression applied to the interval of time, usually quite definite in length, between the moment of entrance of bacteria into the body and the first appearance of the symptoms of consequent disease. The explanations ventured for this characteristic delay have not always been easily squared with the facts. Obviously the small number of bacteria which gain an inroad into the tissues in spontaneous infection is entirely inadequate in itself to produce symptoms. Part at least of the incubation time is therefore postulated to be consumed in the multiplication of the bacteria—their growth, distribution and accumulation in number sufficient to cause a noticeable physiologic disturbance. Less clear is the function, commonly assigned to part of the incubation period, for the action of the toxin or poison produced by the invading micro-organism.

Illuminating evidence has been shed on the nature of the defensive mechanism and immunity responses on the part of infected animals, by Bull[1] of the Rockefeller Institute for Medical Research, New York. He devoted his attention to what takes place in the dog when it is infected with pneumococci. The dog was chosen because of the alleged comparatively high resistance which this species exhibits to these micro-organisms; for here the mechanism of the immunity might disclose itself more readily than in individuals like rabbits, which promptly succumb with septicemia to an exceedingly small quantity of a virulent culture of pneumococci.

Bull found that injected cocci leave the circulating blood with rapidity. The mass of bacteria introduced disappears within so short a period as ten minutes; but the pneumococci reinvade the blood a day or two later. In dogs the septicemia reaches its climax between the fourth and fifth days and then abruptly declines, the blood becoming sterile within from one to three days after the height of the septicemia is reached. This would probably be the end of the infection if it were not for the fact that a meningitis may develop in the meantime.

The initial disappearance of the pneumococci from the circulation has been found to be due to the agglutination of the diplococci within the blood stream and to the accumulation of the clumps in the lungs, liver, spleen and other organs. The significance of this reaction in resistance to infection was recently discussed in THE JOURNAL.[2] By successive reinoculations at various stages in the processes already described, Bull has ascertained that the pneumococci are able to reinvade the circulation because they have acquired a fastness to the existing antibodies. The latter have not become exhausted; but serum which once agglutinated and opsonized the original cultures later fails to be able to accomplish this protective result. On the other hand, pneumococci isolated as the infection is subsiding are more susceptible to the action of immune serums than the original cultures injected. Bull remarks that this seemingly paradoxical finding that the pneumococci become more resistant to the action of antibodies in the early part of the infection and later more susceptible is probably due to the nature and strength of the antibodies operative at the different phases of the infection. In the incubation period, only the natural antibodies are present, while in the decline of the septicemia acquired antibodies have appeared.

On the basis of the newer observations,[1] it is suggested that the incubation period of infectious diseases is due to the fact that the infecting agents must become adapted to the adverse conditions encountered in the newly infected host before they can multiply sufficiently to produce the symptoms of disease. It is further suggested that epidemics may arise because the infectious agent is passed from person to person in the ascending stage of the disease and thus enters new hosts in a state of maximum resistance to the natural antibodies of such individuals. When early contacts are avoided, epidemics tend to subside because the infectious agent is weakened by the action of acquired antibodies during convalescence.

The part played by the newly acquired antibodies at the time of the crisis in the septicemia gives a possible clue to the scheme of the natural recovery from infectious diseases in man. If the host can offer sufficient resistance to the invading bacteria, Bull says,

1. Bull, C. G.: Immunity Factors in the Pneumococcus Infection in the Dog, Jour. Exper. Med., 1916, xxiv, 7.

2. Resistance to Infection, editorial, Oct. 21, 1916, p. 1230.

to forestall a profound depression of the physiologic functions, or a fatal issue, until specific antibodies can be formed and mobilized, recovery will result. On the other hand, if the host offers little or no resistance to the bacteria at the time of infection, and the incubation period is eliminated, the battle is lost before defensive antibodies can be formed. The latter condition is found in the case of pneumococcus septicemia in rabbits, and the former in pneumococcus septicemia in dogs. Comparative pathology, thus fruitful in its results, must be depended on to bring still further and fuller knowledge of infection and resistance in general.

THE RAPIDITY WITH WHICH SUGARS BECOME AVAILABLE FOR METABOLISM

The fact that a considerable period of time usually elapses before the stomach becomes empty after an ordinary mixed meal tends to lead us to forget how rapidly certain foodstuffs may become available for metabolic use if only they reach a place suitable for absorption and are in a form appropriate for entrance into the circulation. It ought not to be surprising, when one stops to consider the promptness with which drugs introduced by mouth may unfold their pharmacodynamic potency and thereby give indication of having been absorbed from the alimentary canal. But in the case of foods there are few tangible evidences of absorption that do not require some special technic or laborious examination to bring them to light. Once the food is eaten, the progress of its ingredients in the nutritive exchanges becomes veiled in mystery to the subject who ingests it.

There is more than mere theoretical interest in knowing what food materials are most promptly available. Nutritive emergencies, though not frequent, do arise at times. The tendency at present would probably be to resort to intravenous rather than gastroenteric modes of nutrition under such circumstances. It may come as a surprise, therefore, to learn that some of the sugars may begin to be burned in the organism within from five to ten minutes after they are ingested. Higgins,[1] of the Nutrition Laboratory of the Carnegie Institution, has employed the respiratory quotient, now easily determinable in the human individual, as a means of recognizing the immediate fate of the ingested substance. Sucrose, lactose and levulose begin to be burned very promptly, that is, within ten minutes, when they are ingested into an empty stomach so that they are rapidly passed into the absorbing intestine.

Glucose and maltose, on the other hand, are not utilized as food as soon as the other sugars just mentioned. From twenty to thirty minutes may elapse before their combustion plays any important part in the metabolism. This does not mean that glucose or maltose—which yields glucose prior to its absorption from the digestive tract—are inferior foodstuffs. Higgins comments that the outcome of such observations makes it clear that there is a fundamental and distinct difference in the metabolism of the various sugars in man, and that from a nutritional point of view one must recognize the possible necessity of differentiating between them in their action and use. One might say in brief, Higgins adds, that levulose and sometimes galactose, judging from the respiratory quotient, shows a tendency or a preference to change to fat in the body, while glucose tends to change to glycogen and be stored as such.

That maltose behaves so similarly to glucose is to be expected from its being a disaccharid yielding two molecules of glucose. Sucrose, the common sugar of the table, breaks down in digestive hydrolysis to give one molecule of levulose and one of glucose. Probably it is its levulose fraction which affects the respiratory quotient so promptly. Lactose, or milk sugar, furnishing galactose and glucose on hydrolysis, similarly seems to owe its rapid metabolism to the galactose rather than the glucose moiety of the molecule.

It may further appear surprising that some of these sugars begin to be burned in the body quite as promptly as is alcohol administered under comparable conditions, despite the very rapid absorption of alcohol, beginning in the stomach itself. Although alcohol thus is not available as a food any sooner than are some of the sugars, it will be burned in preference to sugar when the two are taken together.[2] Alcohol begins to be burned in appreciable quantity in from five to eleven minutes after it is taken, the rapidity varying with different persons.

CREATIN, CREATININ AND MUSCLE TISSUE

It is difficult to believe that two comparatively simple compounds so nearly alike in chemical structure and so readily converted, each into the other, as are creatin and creatinin do not have some intimate interrelationship in the organism where both occur. Ordinarily each of these substances is restricted in its appearance to some definite tissue locality. Creatin is primarily a constituent of muscle; whereas creatinin occurs in the blood and the urine, and is currently believed to represent an end-product of a particular type of endogenous tissue metabolism. The appearance of creatin in the urine, in adult life, at once suggests the existence of an unusual if not a technically abnormal functional condition.

The chemically trained mind, recognizing the structural resemblances between these two biologically important substances, is naturally inclined to the sup-

1. Higgins, H. L.: The Rapidity with Which Alcohol and Some Sugars May Serve as Nutriment, Am. Jour. Physiol., 1916, xli, 258.

2. Tögel, Brezina and Durig: Biochem. Ztschr., 1913, L, 296.

position that urinary creatinin is derived from muscle creatin. The physiologic evidence in support of such a belief has not always been convincing; nor has the place of origin of the excreted creatinin been discovered with any degree of certainty. One mode of attacking the problem has consisted in feeding or injecting creatin into the living organism and attempting to follow its fate. Another direction of investigation has led to the study of what changes, if any, the creatin of muscle may undergo under conditions of tissue survival.[1] Gottlieb and his collaborators believed several years ago that they had demonstrated the existence of specific enzymes in muscle which could convert these substances into each other. Their work has been the subject of lively criticism, doubtless in part justified; nevertheless, the careful researches of Myers and Fine[2] on the metabolism of creatin and creatinin tend distinctly to the conclusion that muscular tissue is the site of creatinin formation.

Newer experiments by Hoagland and McBryde[3] of the Bureau of Animal Industry in Washington show very clearly the transformation of muscle creatin into creatinin during autolysis. Judging by their results, this reaction must be ascribed to a very considerable degree, at least, to its facilitation by enzymes. The special value of this new contribution lies in the fact that the investigators were successful in conducting the autolysis of muscle under the conditions of strict asepsis, obtainable only with difficulty, yet essential. The objectionable possibility of the interference of bacteria, on the one hand, or the inhibitory effect of added antiseptics, on the other, was thus averted. In the course of the postmortem aseptic autolysis of muscle tissue, which exhibits in a marked degree the property of converting creatin into creatinin, an equilibrium between these substances is finally established. In life, however, with an intact circulation and continuous removal of the product of the reaction, the continued production of creatinin would not necessarily be impeded in the same way.

Muscular tissue appears to have, in an appreciable degree, the ability both to produce and to destroy creatinin. Obviously all of these findings must be regarded as having some bearing, indirect though it may be, on the formation of creatinin in the body. At any rate, the government investigators, taking into account the now known facts on the subject, are convinced that there is much evidence in support of the theory that muscle creatin is the source of urinary creatinin, with a creatin-creatinin-free diet, and considerable evidence to the effect that in part, at least, the transformation of creatin into creatinin takes place in the muscular tissue.

1. These questions have been discussed in editorials published in THE JOURNAL during the past two or three years.
2. Myers, V. C., and Fine, M. S.: The Metabolism of Creatine and Creatinine, tenth paper, The Relationship Between Creatine and Creatinine in Autolyzing Tissue, Jour. Biol. Chem., 1915, xxi, 583.
3. Hoagland, R., and McBryde, C. N.: Effect of Autolysis upon Muscle Creatin, Jour. Agric. Research, 1916, vi, 535.

Current Comment

INDUSTRIAL ACCIDENTS

The workmen's compensation law, passed by Congress to give to certain government employees the right to receive compensation for injury sustained in the course of their employment, became effective, Aug. 1, 1908. Bloedorn[1] describes the method of recording injuries in the United States Navy Yard at Washington, D. C., developed since that date, and analyzes the various factors which entered into the production of accidents for a period of two years beginning Jan. 1, 1914. The average number of men employed during these two years was 3,202. The total number of men who reported one or more injuries was 2,178. The statistics were studied from every conceivable point of view, and a mere statement of the chief results of this analysis is instructive. The highest percentage of injuries occurred among employees between the ages of 16 and 20, and decreased steadily to those between the ages of 50 and 59, from which point there was a constant rise with advancing age. A higher injury rate was shown by colored than by white employees, although engaged in less hazardous work as a rule, and by single than by married employees. The injury rate was markedly higher during the first six months of employment, and skilled employees showed the lowest percentage, whereas helpers and apprentices showed the highest percentage. The day of the week had a very slight influence. It is especially interesting to note that the greatest percentage of injuries occurred during the first two hours of work, with a steady decline for each two-hour period thereafter. The author believes that the first two hours constitute the period of adjustment of the workman to his machinery, and that during this period the workman is more susceptible to injury. Of 4,711 injuries received by 2,178 men, 1,263 were received by 188 men; in other words, a small number, 8.6 per cent., of the total number of men injured received over 26 per cent. of the total number of injuries. While these are the chief factors of interest in the analysis, many others are discussed, for example, the type of injury, the duration of illness, the percentage of accidents in various working shifts, and the percentage of fatal accidents. As a result of his study, Bloedorn makes several recommendations. In accordance with the foregoing analysis, he recommends that the new employee be given especial attention until he becomes accustomed to his machinery and to his fellow employees; that special effort be made to avoid accidents during the first two-hour period during the day; that particular attention be given to shops which show a high percentage of injuries, and that certain dangerous machinery be provided with guards wherever practicable. The large number of injuries to eyes suggests, of course, the use of protective goggles, and Bloedorn recommends that these goggles be made compulsory for all employees engaged in work which

1. Bloedorn, W. A.: Studies of Industrial Accidents which Occurred in the Navy Yard at Washington, D. C., U. S. Naval Medical Bulletin, 1916, x, 585.

exposes the eye to frequent injury from flying particles; he recommends also that employees who appear most susceptible to injury be given particular attention, and that an effort be made to decrease their susceptibility to injury either by correcting any physical defects which may exist, or by inspection and attention along the lines of accident prevention. The national movement toward accident prevention, toward safety and toward the limitation of preventable hazards to life is gaining impetus. Organizations like the Safety First Federation, the National Safety Council, public safety commissions, and the committees on accident prevention of various civic organizations, are spending time, energy and money in investigation as to the sources of industrial and other accidents with a view to correcting the conditions on the basis of a complete analysis of the causes. A most significant fact is the determination by Bloedorn that a certain percentage of workmen are especially susceptible to injury, and that this susceptibility is based frequently on physical defect, and perhaps still more frequently on mental defect. The problems of accident prevention are equally problems for the physician and for the engineer.

THE MEDICAL OFFICERS' RESERVE CORPS

By the terms of the army bill passed June 3, 1916, the Medical Reserve Corps, as now authorized by law, will cease to exist after June 3, 1917. According to a circular just issued by the assistant surgeon-general, officers of the present Medical Reserve Corps may be transferred to the Officers' Reserve Corps at any time prior to June 3, 1917. There is a slight change in name, but without change in relation to the surgeon-general's office. The new corps, however, will be on a more practical basis than is the present one. Under the present arrangement the officers of the Medical Reserve Corps are such in name only; under the new order, the members of the Officers' Reserve Corps assume responsibilities which will guarantee their efficiency and dependability in time of need. The commissions are issued for a period of only five years; at the end of that time officers may be recommissioned with reexaminations. Attendance at camps of instruction is required for a period of fifteen days in each year, the government paying the transportation and subsistence to and from camp, and subsistence while in camp. Officers are, further, required to complete a correspondence course conducted by the field service and correspondence school for medical officers. This has been optional in the past. In time of peace no officer above the grade of first lieutenant can be ordered into active duty, but first lieutenants may be so ordered. In time of war or stress, the service of all reserve officers is at the disposal of the government as against the provision of the old law in which reserve corps officers could be called to active duty only with their own consent. The holding of two commissions, that is, a commission in the Officers' Reserve Corps and in the National Guard, will not be permitted. The law, without doubt, is a decided improvement, and gives to the United States Army a more reliable and more serviceable medical corps. Every officer in the new medical reserve corps may be counted on for actual service in time of need, and through the correspondence course and the required annual camp instruction will be a more efficient unit.

MEMBERSHIP IN THE ARMY MEDICAL CORPS AS A CAREER

Congress has finally placed the medical department on a definite and satisfactory working basis. The new act provides for a fixed ratio of medical officers to the enlisted strength of the army, which automatically increases or decreases the total strength of the Medical Corps as the army is increased or decreased by law. At the same time the law preserves the definite ratio of field rank now existing. This is the most important step in medical legislation, so far as it relates to the army service, ever enacted into law. The act referred to carries seven medical officers to each thousand authorized enlisted men of the army. When in full effect, the Medical Corps will be increased from 443 to 1,553 medical officers, creating for each of the five increments 222 vacancies. THE JOURNAL has received notice from the surgeon-general that an examination of applicants for commission in the Medical Corps will be held at various points throughout the United States, Jan. 2, 1917; furthermore, that the present session of the Army Medical School will close Feb. 28, 1917, and that successful candidates in the January examination will be ordered to the Army Medical School, March 1, for the usual course of instruction. This is an innovation for the medical department, as heretofore only one term each year has been the rule. Candidates who qualify in January will by this plan receive their commissions in the Medical Corps one year earlier than heretofore. There is much in the Medical Corps to appeal to the young physician. There is the opportunity to specialize, to perfect oneself in some particular branch of the profession without the ever present financial difficulties of the young physician struggling for a livelihood. Every officer of the corps is required to meet certain requirements. He can meet these requirements only by constant application. Every officer is encouraged to specialize, and prior to examination for promotion informs the board of his specialty, if any. He is examined on this subject. So far as the interests of the government will permit, an officer who is qualified is assigned to duty and station where there is an opportunity to follow his specialty. Laboratories, operating rooms, libraries, etc., of all post hospitals are equipped for research work, offering opportunities for original investigation which come to the lot of few in civil life. That medical officers have taken advantage of the opportunities, medical literature testifies. From Beaumont to Gorgas one finds a list of brilliant names, men whose work has been a boon not only to the army but also to humanity at large. THE JOURNAL commends to the young men of the medical profession as a life work the Medical Corps of the army. It is not a life of ease or one of large financial return. As has been said by Hon. James Hay, late chairman of the

Committee on Military Affairs, House of Representatives:

The story of medicine and surgery in our army reads like a romance. It is all the more a romance because these achievements were the work of men inspired solely by that stern sense of duty which prevails in the army, without the hope of personal reward or financial gain. The immense benefits that have thus come to soldiers everywhere, and to humanity in general, have been entirely the fruit of labors of love.

SPORTING NOTE

Those who rely on THE JOURNAL for their knowledge of sporting events doubtless read with interest, in last week's issue, the alleged secret of Ty Cobb's success as a baseball batter — "Nuxated Iron." While THE JOURNAL hesitates to appear in the rôle of competitor with the *Police Gazette* or the *Pink'Un*, it feels impelled to chronicle another item that is of contemporaneous interest with the iron that made Ty Cobb famous. It appears from publications, more sophisticated than we in the matter of outdoor sports, that articles have appeared and are again to appear under Mr. Cobb's name describing incidents of interest to baseball enthusiasts. A recent issue of the Chicago *Tribune* in referring to this particular phase of Mr. Cobb's activities said:

"In spite of all efforts to forbid it, Ty Cobb signed a contract allowing the use of his name as alleged writer of a series of syndicate stories on the series in defiance of President Johnson's mandate to the contrary. . . . As it might mean a lawsuit to break Cobb's contract, the syndicate will be permitted to deceive the public again into thinking Cobb can write as well as play baseball. . . . President Johnson has suggested that the Baseball Writers' Association take action on the matter which will authorize him in future to use more drastic methods to stop this gulling of the public."

Here we have the germ of an idea that is worthy of extension. It seems that the organization of baseball writers objects to baseball players of national prominence posing as authors of articles which they are incapable of writing. If now we could only persuade the Amalgamated Order of "Patent Medicine" Testimonial Writers to make a similar protest the public might gain in honesty what it would lose in amusement. If the writers of testimonials really had to take the dope for which they are willing — for one reason or another — to stand sponsor, it would redound to the interest of good sportsmanship and old-fashioned truthfulness, although the testimonial industry itself might receive a set-back.

THE PASSING OF BEECHAM

The manufacturer of "Beecham's Pills" is dead. He made his millions from the sale of two products, "Beecham's Pills" and "Beecham's Cough Pills." The former was essentially an aloes pill that has, in the past at least, been sold as a "cure" for kidney disease, gonorrhea, syphilis, "all nervous affections," and for women who "find any unusual delay" in their menstruation. The "Cough Pills" — as sold in the British Isles — contained morphin, until the law required "patent medicines" containing morphin and some other poisons to be labeled "poison"; then the morphin was taken out. This was admitted by Beecham himself when he appeared before the Select Committee on "Patent Medicines." As Sir Henry Norman, chairman of the committee, said: "You took the morphin out, not because you thought it unnecessary medicinally in the drug, but because you found it convenient for trade purposes not to have it in?" "Yes," said Beecham, "that was all." Beecham's testimony before this committee was interesting. He was made to admit that his "Cough Pills" as sold in the United States contain no morphin; he was further forced to admit that Beecham's Pills sold in Australia contained no reference to their alleged curative powers over gonorrhea and syphilis, diseases, by the way, which he euphemistically described as "Secret Maladies." The history of Beecham's Pills is a "patent medicine" epic: a product of the most ordinary kind, invested with miraculous properties and forced on the public by the irresistible power of modern advertising backed by vast capital. "Beecham's Pills — Worth a Guinea a Box," a slogan obviously and essentially false, and the foundation on which a fortune was built. Beecham made his millions out of a humbugged public. Like others in similar lines of business, he seems to have been free with his easily gotten wealth, and he attained some reputation as a philanthropist. In 1911 he was made a knight, in 1914 a baronet. This might indicate that it matters little how you make your money provided you make enough of it and spend it freely. "My son," admonished a cynical father, "make money, honestly if you can, but make money."

CRITICISM OF METHODS OF QUARANTINE IN INFANTILE PARALYSIS

In an address delivered before the American Public Health Association this week on "The Essential Statistics of Infantile Paralysis," Mr. Frederick L. Hoffmann is reported to have said, in summarizing the results of his investigations, that "the evidence was apparently quite conclusive that the methods of federal and state quarantine adopted for the purpose of disease control had been quite ineffective, and possibly more of a hindrance than a help in the intelligent and rational administrative supervision and control of the disease." THE JOURNAL holds no brief for the federal and state health officers, but such a broad condemnation of the efforts of these public officials does not appear to be justified by scientific evidence, or by any statistics which thus far have been presented. No one can conjecture what the extent of the epidemic might have been without the establishment of the measures which were instituted.

The Harvest.—"Does God fix the death rate? Once men were taught so, and death was regarded as an act of Divine Providence, often inscrutable. We are now coming to look on infant mortality as evidence of human weakness, ignorance and cupidity. We believe that Providence works through human agencies, and that in this field, as in others, we reap what we sow—no more and no less."—Dr. L. Emmett Holt.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST; SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

DELAWARE

Personal.—Dr. Joshua A. Ellegood, Wilmington, has been elected president of the Delaware Society for Social Hygiene.

New State Society Officers.—The annual meeting of the Delaware State Medical Society was held at Milford, October 9 and 10, under the presidency of Dr. George I. McKelway, Dover. The address in surgery was delivered by Dr. Charles H. Frazier, Philadelphia. Middletown was selected as the place of meeting for 1917, and the following officers were elected: president, Dr. James Beebe, Lewes; vice president, Dr. John Ball, Elsmere; secretary, Dr. George W. K. Forrest, Wilmington (reelected); treasurer, Dr. Samuel C. Rumford, Wilmington, and delegate to the American Medical Association, Dr. Willard Springer, Wilmington.

ILLINOIS

Diphtheria in School.—River Forest Grammar School was ordered closed for a week, October 17, on account of the discovery of six cases of diphtheria among its pupils.

Personal.—Dr. Raymond L. Hatfield, Danville, suffered a severe electrical shock from a Roentgen-ray machine at St. Elizabeth's Hospital, Danville, October 16.——Dr. Alvin B. Cary, Donnellson, was operated on for disease of the kidney in the Jewish Hospital, St. Louis, October 14.

Ogle County Tuberculosis.—At a meeting held in Oregon, Ogle County, September 15, an organization was formed for the prevention of tuberculosis. An exhibit was made at the Ogle County Fair. The question of whether or not Ogle County shall have a sanatorium for the treatment of tuberculosis will be submitted to the voters at the election next month.

Harvey Tercentennial.—Dr. Frederick G. Novy, Ann Arbor, Mich., delivered the opening address of the Harvey Tercentennial, which was held in Galesburg, October 13, under the auspices of the Kent County Medical Society. The subject was "Anaphylaxis and Anaphylatoxin." Addresses were also delivered by Drs. George W. Crile, Cleveland, and Bertram W. Sippy, Chicago.

Medical Unpreparedness.—At the opening exercises of the College of Medicine of the University of Illinois, held in Chicago, October 5, Edmund Janes James, president of the university, delivered an address on the "Functions of the State in the Promotion of Medical Education and Research," in which he pictured the unpreparedness of the United States in matters of public health and called attention to the great ignorance regarding the cause and the means of prevention of the many and the most common diseases.

Chicago

Personal.—Dr. Harry C. Rolnick has reached Berlin on his way from the Graudenz Hospital to his new post of duty at the psychopathic hospital in Pardubitz, Bohemia.

New Appropriation for Poliomyelitis.—The city council, October 9, passed an ordinance appropriating to the health department $17,000 to continue its work against anterior poliomyelitis.

Typhoid Fever at High School.—Numerous cases of typhoid fever have recently been reported among students of the Englewood High School. The source of infection is believed to be a typhoid carrier.

Lectures at Children's Hospital.—A series of lectures on the care of children is to be given at the Children's Memorial Hospital, on Wednesdays, at 11 a. m. The lecturers include Drs. Henry F. Helmholz, Samuel J. Walker, Frank S. Churchill, Coleman G. Buford, Edwin W. Ryerson and Miss Elsie Burks, New York.

Antituberculosis Meeting.—The twenty-second meeting of the Robert Koch Society for the study of tuberculosis was held, October 26, at the Hotel Morrison. Dr. Harry J. Corper spoke on "Some Interesting Laboratory Problems in Tuberculosis," and Dr. Walter A. Gekler discussed the "Clinical Applications of These Problems."

Boats Must Purify Water.—Orders were issued, September 17, by the United States Public Health Service that the passenger steamers on the Great Lakes shall either install water purifying plants or take water on board at port of call. Of the twenty-two passenger steamships entering the port of Chicago, eleven have already complied with the requests, previously made, by the installation of violet ray plants.

Diphtheria Epidemic.—Diphtheria is reported to be prevalent in South Chicago, where forty-seven cases have been reported.——The examination of the pupils at the Frances Willard Public School by the health department physicians revealed more than forty diphtheria carriers. Four children are under quarantine at their homes.——During September, more than 150 cases of diphtheria were reported in the city.

Studies Mental Defectives.—Dr. Henry I. Adler, chief of staff of the Boston Psychopathic Hospital, is spending several months in Chicago at the request of the Civic Club and the Illinois Society for Mental Hygiene, under the auspices of the Rockefeller Foundation. His especial work is to be a survey of the mental defectives of Chicago and Cook County, and he will work in the courts and other institutions where there are facilities for detecting and handling defectives.

MARYLAND

English Physicians in Baltimore.—Sir Henry Burdett and Dr. A. C. Morton, London, England, were the guests of honor at a dinner given by Dr. Winford H. Smith, superintendent of Johns Hopkins Hospital, at the Maryland Club, September 30.

State Appropriation for University.—The University of Maryland has recently obtained the state appropriation of $15,000 for medical education for 1915 and a similar amount for 1916, which, owing to the financial embarassment of the state treasury, was not paid when due. The whole amount of $30,000 has now been paid.

Gift to Hopkins.—Isaac F. Nicholson, Baltimore, celebrated his eightieth birthday by giving the Johns Hopkins University $15,000 for the establishment of the Isaac Forester Nicholson Fund, to establish scholarships for needy students from Baltimore or the state of Maryland, or to be used for any other purpose the trustees may desire.

Personal.—Dr. James A. Nydegger, U. S. P. H. S., has resigned the chair of tropical medicine at the University of Maryland, as his public health service duties claim his entire time.——Dr. Arminius C. Pole, after many years' service as professor of anatomy in the Baltimore Medical College and professor of descriptive anatomy in the University of Maryland since the merger of the two schools in 1913, has resigned. ——Dr. William L. Smith, Riderwood, who has been in ill health for the last six months, underwent a successful operation at the Union Protestant Infirmary, October 19.

Modification of Infantile Paralysis Quarantine.—A further modification of the infantile paralysis quarantine in Baltimore will permit children 9 years of age and over to return to school and to attend moving picture theaters. The quarantine may be lifted entirely after next week, as the plague seems to be on the wane. During the past week comparatively few cases were reported to the city health department.——The outbreak in Garrett County is being investigated by the state board of health to determine whether or not the disease was imported from Pennsylvania. There have been twenty-two cases in Garrett County since July 1.

MASSACHUSETTS

Health Association Meeting.—At the October meeting of the Massachusetts Association of the Boards of Health, held in Holyoke, October 19, the program included a discussion on the tuberculous cow, quarantine hysteria and anterior poliomyelitis.

Personal.—Dr. Maynard Ladd has succeeded Dr. Arthur A. Howard as physician in chief of the children's department and of the hospital for children of the Boston Dispensary. ——Dr. Bernard W. Carey, Fitchburg, chairman of the state board of health, has resumed practice after a long illness from septicemia.

Changes at Harvard.—The following appointments were announced by the overseers of Harvard University: Drs. Edward Hall Nichols and Charles Allen Porter have been elected clinical professors of surgery in the Harvard Medical School, and the following assistants have been appointed:

Donald Mitchell Glover and Joseph Haskill McGuire, histology; MacIver Woody, Harry Saul Bernstein and Francis Lowell Burnett, pathology; George Glymer, alumni assistant in neurology, and Leroy Upson, Gardner, instructor in pathology. The following appointments have been made on the staff of the Collis P. Huntington Memorial Hospital: Dr. Robert Battey Greenough, surgeon in charge; Dr. Edward Hammond Risley, assistant surgeon; Dr. George Adams Leland, Jr., surgeon of outpatients, and Dr. Frank Weld Peabody, consulting physician. The resignations of Albert Alphonso Wood Ghoreyeb, a fellow in pathology; Louis Harry Newburgh, alumni assistant in medicine, and James Earle Ash, instructor in pathology, were accepted.

MINNESOTA

New State Officers.—At the annual meeting of the Minnesota State Medical Association, held in Minneapolis, October 11 to 13, under the presidency of Dr. J. Warren Little, Minneapolis, the following officers were elected: president, Dr. Harper M. Workman, Tracy; vice presidents, Dr. John H. Adair, Owatonna; Arthur C. Rogers, Faribault, and Herman M. Johnson, Dawson; secretary, Dr. Thomas McDavid, St. Paul (reelected); treasurer, Dr. Earl L. Hare, Minneapolis; councilors, Drs. Joseph G. Millspaugh, Little Falls, second district; Warren A. Dennis, St. Paul, third district, and Clarence E. Persons, Marshall, fifth district; delegates to the American Medical Association, Drs. Warren L. Beebe, St. Cloud, and Harry P. Ritchie, St. Paul, and alternates, Drs. George D. Head, Minneapolis, and William H. Magie, Duluth. The next meeting of the association will be held in St. Paul, October, 1917.

Sanatorium Notes.—The Wabasha County Tuberculosis Sanatorium, which is to be known as Buena Vista Sanatorium, near Lake City, was ready for opening, October 15. The buildings consist of an administrative building in the center with a 90-foot wing on each side, each wing having ten rooms, one for men and one for women, and each room having a separate porch. The cost of the sanatorium, including site, construction and equipment, has been about $40,000, of which the state contributes one half.——The plans for the new building at the Glen Lake Tuberculosis Sanatorium, to be erected at a cost of $30,000, with beds for thirty-four patients, were blocked, September 16, when the county commissioners in their request to the board of tax levy cut the appropriation of $57,000 to $35,000.——The Clay Becker Sanatorium, Lake Park, was given its final inspection, September 11, and after acceptance by the commissioners will be ready for opening.——According to the plans of the Lake Julia Sanatorium board, a free clinic is to be established in Bemidji under the charge of Dr. Leo G. Guyer, Lake Park.

NEW MEXICO

Personal.—Dr. Benjamin H. Frayser, Shiprock, first lieutenant, M. R. C., U. S. Army, has been ordered for active duty in the southern department.——Dr. Ignatz D. Loewy has succeeded Dr. Thomas J. Cummins as medical director of St. Joseph's Sanitarium, Silver City.——Dr. Edward A. Montenyohl, Deming, is spending several months as a member of the house staff of the Willard Parker Hospital, New York, in the service of the poliomyelitis wards.

New State Officers.—At the annual meeting of the New Mexico Medical Society, held in Albuquerque, October 11 to 13, Las Cruces was selected as the place of meeting for next year. The following officers were elected: president, Dr. Clifford S. Losey, East Las Vegas; president-elect, Dr. John W. Kingsinger, Roswell; vice presidents, Drs. Charles A. Frank, Albuquerque; Franklin H. Crail, East Las Vegas, and Hugh V. Fall, Roswell; secretary, Dr. Robert E. McBride, Las Cruces; treasurer, Dr. Frank E. Tull, Albuquerque, and councilors, Drs. Walter Kaser, East Las Vegas; Harry A. Miller, Clovis, and George S. McLandress, Albuquerque.

NEW YORK

State Clinics for Poliomyelitis Cripples.—The first clinic for the after-care of cases of poliomyelitis was opened, October 17, at White Plains. Dr. Robert W. Lovett, Boston, will examine each patient and direct the treatment. Later it is planned to hold clinics in other parts of the state. Over thirty patients were examined the first day of the clinic. Clinics were held at Mount Vernon and Port Chester, October 18, in North Tarrytown, October 20, and at Yonkers, October 21.

Personal.—Dr. Earl G. Danser, Buffalo, has been nominated for representative to the assembly from the seventh district.——Dr. Arthur Eisbein has been appointed city diagnostician.——Dr. Francis J. Lennon has been appointed city physician, replacing Dr. Herbert H. Bauckus, who has been on a year's leave of absence.——Drs. John and Edward S. Van Duyn, Syracuse, recently returned after several months in the French army hospital service.

Quarantine at Cornell and Vassar.—It is reported that all Cornell students who roomed at a house where a case of infantile paralysis developed have been quarantined for two weeks. This is the first case of infantile paralysis that has appeared at Ithaca for many months. Although there have been no cases of infantile paralysis at Vassar College, that institution has been placed under strict quarantine and students warned against visiting New York.

New York City

Cartwright Lectures.—The Cartwright lectures of the association of the alumni of the College of Physicians and Surgeons were delivered at that institution, October 24 and 25, by Dr. Richard M. Pearce of the University of Pennsylvania on "The Spleen in its Relation to Blood Destruction and Regeneration."

War Antitoxin.—In a hearing on the budget, it is reported that Health Commissioner Emerson made the statement that the laboratories of the department of health have furnished $205,000 worth of antitoxin to Europe since the outbreak of the war, two thirds of which had gone to the allies. The state provides that the city of New York may sell its surplus antitoxins produced by the department, but that the money accruing from such sales must be used in the production of more antitoxins or for the prevention and treatment of infectious diseases.

Case Fatality of Poliomyelitis.—Up to October 16, there have been 9,209 cases of poliomyelitis placed under quarantine in this city. Of these, 250 were found after careful investigation not to be true cases of poliomyelitis. The total number of deaths recorded is 2,362, or a case fatality of 26.24. The total number of cases admitted to hospitals was 5,294, and the total number treated 4,474. This difference in the admissions and number of cases treated was due to transfers from one hospital to another. From August 31 to October 13, there have been discharged from the hospitals of the department of health 2,053 cases. Of these 66 per cent. showed evidences of paralysis to some extent; 15 per cent. showed that paralysis had wholly disappeared, and 15 per cent. had not shown paralysis at any time. It has been estimated that 75 or 80 per cent. of those crippled will fall into the class that will receive free treatment.

Antirabic Work.—The comparative statistics of the health department for 1915 and 1916 show the effect of active antirabic work in diminishing the number of cases of rabies. The number of persons examined for dog bite during the first and second quarters of this year totaled 1,320, while during the corresponding period of 1915 the number was 1,655, a diminution of more than 20 per cent., which may be attributed to the muzzling regulation. The number of dogs suspected of rabies and removed for examination diminished from 3,044 to 699, and the number of cases of rabies in dogs from forty-seven to fourteen, 70 per cent. reduction. There have been no deaths from rabies in the first six months of 1916. The antiglanders work shows an increase in the number of horses examined and tested with mallein from 562 for the first six months of 1915 to 1,866 for 1916. There was a reduction in the number of horses condemned as afflicted with glanders from 393 to 213.

NORTH CAROLINA

Hospital Wards Opened.—October 16, the maternity and baby wards of the Biltmore Hospital were formally opened with appropriate ceremony. These wards were the gifts, respectively, of the widows of the late George W. Vanderbilt and Alfred Gwynne Vanderbilt.

Illegal Practitioner Prosecuted.—The State Board of Medical Examiners, operating under the new statute, has instituted a number of suits against illegal practitioners through the office of the attorney general. Information regarding illegal practitioners in the state sent to the secretary of the board, Dr. Hubert A. Royster, Raleigh, will be received in confidence and placed in the proper hands for prosecution, and the case will be pressed to a prompt trial.

Portrait Presented.—At Raleigh, October 13, Chief Justice Walter Clark, on behalf of the state, received from Dr. Louis

J. Picot an oil painting of the late Dr. George W. Long. Graham. Dr. Long was formerly a member of the State Board of Medical Examiners, president of the state medical society, and was widely known and respected. This gift of his portrait to the state by his professional friends is timely and appropriate.

Personal.—Dr. Lauren O. Gibson, Statesville, has opened a private surgical hospital, and has associated with him in the management Dr. Addison G. Brenizer, Charlotte.——Dr. William H. Smith, Goldsboro, has been elected county physician for Wayne County, succeeding Dr. Richard W. Spicer, resigned to accept service with the National Guard on the southern border.——Lieut. J. W. O'Connell, now on duty with the National Guard at El Paso, has resigned and resumed his duties as college physician and teacher of biology at Davidson College.

PENNSYLVANIA

Personal.—Dr. Claud D. Roop, Lancaster, has entered on his duties as assistant physician at the State Hospital, Norristown.

Dauphin Physicians Organized.—Physicians in the upper end of Dauphin County have organized a branch of the county medical society, with Dr. Charles M. Rickert, Millersburg, as president; Dr. Harry A. Shaffer, Williamstown, as vice president, and Dr. Joseph W. Shaffer, Elizabethville, as secretary.

Railway Surgeons' Association.—The ninth annual convention of the Railway Surgeons' Association of the Pennsylvania lines east of Pittsburgh was held at the Bellevue-Stratford, October 19 to 21. The following officers were elected: president, Dr. W. B. Henderson, Phillipsburg; vice president, Dr. Charles J. Roberts, Berwyn; secretary, Dr. Amos W. Colcord, Clairton, and treasurer, Dr. Joseph C. Egbert, Wayne.

Northumberland County and Clean Milk.—The Northumberland County Medical Society has undertaken a thorough campaign of education on the subject of clean milk. Following a request for such action, made at the August meeting by Dr. George G. Gill, Sunbury, a committee consisting of Dr. Clay H. Weimer and Dr. Henry T. Simmonds, Shamokin, and Dr. Gill was named to carry on the work. The campaign in Sunbury is well under way with Sunday evening addresses by physicians in the principal churches, daily newspaper articles, and illustrated evening lectures thrice weekly in a large, centrally located tabernacle. Great interest in the movement is evident, and the obtaining of one or more producers of certified milk in the county is assured. Compulsory registration of all milk and ice cream dealers and their sources of supply with a grading of 70 per cent. required, and certificates of health for every person employed in the milk industry, are among the regulations demanded by the committee.

Philadelphia

Infantile Paralysis Report.—Since July 1 and up until October 20, there have been 946 cases in Philadelphia, with 282 deaths. An organization known as Lovers of Children collected $1,347 to buy braces and other necessaries for convalescents.

Funds to Send Doctors to Germany.—A festival, to complete a fund of $16,000, most of which has already been raised to send six Philadelphia doctors to Germany, was held at the Philadelphia Turngemeinde, October 23. The physicians are expected to sail within a few weeks. Instead of taking up posts at various war fronts, they will be sent to cities where there is a shortage of medical men. They will remain six months.

Officers Nominated.—At the regular quarterly business meeting of the Medical Club of Philadelphia, held at the Bellevue-Stratford, October 20, the following officers were nominated: president, Dr. Charles K. Mills and Dr. William D. Robinson; first vice presidents, Drs. D. Oram Ring and William Martin, Atlantic City, N. J.; secretary, Dr. William S. Wray; treasurer, Dr. Louis Adler, Jr., and governors, Drs. Paul J. Sartain and McCluney Radcliffe.

New Hospital Formation.—October 14, the new Masonic Memorial Hospital of Elizabethtown was turned over to the Grand Lodge of the State of Pennsylvania. This hospital was contributed by the Philadelphia Masons, and the cornerstone of the institution was laid, September 29. The building is a three-story granite structure, and is arranged to accommodate thirty-eight patients. The cost of the building was $60,000. Two other buildings will be erected in the near future, at a total cost of $200,000.

Personal.—Dr. Theodore Le Boutillier has been appointed pediatrist to the Philadelphia General Hospital.——Dr. Adolph I. Ringer has been appointed professor of clinical medicine in Fordham University, New York.——Dr. Burton Chance has been chosen by the board of city trusts as an attending surgeon at Wills Eye Hospital.——Dr. Hunter W. Scarlett and Dr. Peter McCall Kettine, who recently returned from serving in the American Ambulance in Paris, will relate their experiences at University Hospital on October 31, the annual donation day.

Rebuild Blockley.—Members of the medical board of Philadelphia General Hospital, consisting of the staff of the institution, met October 16, and unanimously approved of the rebuilding of the Philadelphia Hospital on the present site at Thirty-Fourth and Spruce streets, instead of the establishment of district hospitals, a plan approved by the chamber of commerce. The sum of $1,000,000 is available for expenditure on the new building, and plans have already been drawn for it. One of the reasons against the district hospital idea was that it meant about $8,000,000 more debt for the city.

VERMONT

State Society Meeting.—At the annual meeting of the Vermont State Medical Society, held in St. Johnsbury, October 12 and 13, under the presidency of Dr. William W. Townsend, Rutland, the following officers were elected: president, Dr. Charles H. Beecher, Burlington; vice president, Dr. Charles W. Howland, Shoreham; secretary, Dr. William G. Ricker, St. Johnsbury; treasurer, Dr. Edward H. Martin, Middlebury; councilors, Drs. Schuyler W. Hammond, Rutland, second district, and Dr. Clinton J. Rumrill, Randolph, fourth district; nominees, Drs. Winfield S. Nay, Underhill, and Dr. Walter L. Havens, Chester Depot, and alternate and delegate to the American Medical Association, Dr. Fred T. Kidder, Woodstock. The house of delegates elected the following officers: president, Dr. Patrick E. McSweeney, Burlington; vice presidents, Drs. Fred T. Kidder, Woodstock, and William E. LaZell, Barre, and secretary, Dr. Fred E. Steele, Montpelier. Clinics were conducted by Drs. John R. Williams, Rochester, and Ellsworth Eliot, Jr., Albany. Barre was selected as the next place of meeting.

GENERAL

Western Surgeons' Meeting.—The Western Surgical Association will meet in St. Paul, December 15 and 16, under the presidency of Dr. Lawrence W. Littig, Davenport, Iowa, instead of at Indianapolis, as previously announced.

Prevention of Blindness.—The second annual meeting of the national committee for the prevention of blindness will be held, November 24, in the Academy of Medicine, New York, under the presidency of William Fellows Morgan. The principal address will be delivered by Surg. John McMullen, U. S. P. H. S., who will describe his campaign against trachoma.

Railway Surgeons Elected.—At the annual meeting of the American Association of Railway Surgeons, held in Chicago, October 16 to 19, the following officers were elected: president, Dr. William Battle Malone, Memphis, Tenn.; vice president, Drs. Edwin S. McDonald, Cameron, Mo.; Mark L. Bishoff, Fort Madison, Iowa, and William C. McGrath, Eagle Grove, Iowa; secretary, Dr. Louis J. Michell, Chicago (reelected); treasurer, Dr. Henry B. Jennings, Council Bluffs, Iowa (reelected), and executive board, Drs. Samuel C. Plummer, Chicago, and David Y. Roberts, Louisville (reelected).

Prevention of Infant Mortality.—The seventh annual meeting of the American Association for the Study and Prevention of Infant Mortality was held in Milwaukee, October 19 to 21, under the presidency of Dr. Samuel M. Hamill, Philadelphia. The following officers were elected: president, Dr. William C. Woodward, Washington, D. C.; president-elect, Dr. Philip Van Ingen, New York; vice presidents, Mrs. William Lowell Putnam, Boston, and Dr. Borden S. Veeder, St. Louis; secretary, Mr. Albert Cross, Philadelphia; treasurer, Mr. Austin McLanahan, Baltimore (reelected), and executive secretary, Miss Gertrude Knepp, Baltimore (reelected).

Courts' Decisions on Public Health.—Reprint No. 342 of the *U. S. Public Health Reports* contains the judicial opinions which were published in the *Public Health Reports* between May 30, 1913, and Dec. 31, 1915. It is divided into two parts: digest of judicial opinions, arranged in topical outline, under suitable headings, and the reports of the cases

or excerpts therefrom. The digest covers public health in so far as this subject has been considered by the courts. Opinions relating to house plumbing, noises and offensive odors have not been included. This reprint will be of value to those interested in public health. Its usefulness could be greatly increased, however, by a better index of cases cited. It contains an alphabetical index of the cases published in the second part, but gives the titles only without reference to the official reports; in the digest of the cases, again only the titles are given without official citations. This is most inconvenient if the volume is to be readily used for what is apparently intended, a handy reference to the judicial decisions on public health.

FOREIGN

Festskrift for Professor Müller of Stockholm.—A bulky, finely illustrated volume of 833 pages has been dedicated to Erik Müller, professor of anatomy at the University of Stockholm, by his friends and pupils on the occasion of his fiftieth birthday. It forms No. 3 of volume xlii of the archives of the Swedish Medical Association. Each of the thirty-six articles is accompanied by a summary in German or in French, except one which is to be published in a German medical journal. The *Festskrift* is to be reviewed in the Current Medical Literature Department.

CANADA

Tuberculosis Hospital for Soldiers.—A $50,000 building for soldiers invalided home with tuberculosis will be erected by the London (Ont.) Health Association. This will be established in connection with the Byron Sanatorium in that city. It is being established at the request of the Military Hospitals Commission, and it is expected that the Dominion and provincial governments will each bear one half the cost.

Osler and the Canadian Army Medical Services.—Soon after the war began Sir William Osler was appointed honorary consulting physician at the Queen's Canadian Hospital, Shorncliffe. Since that time he had also been an honorary adviser in connection with the Canadian hospitals generally in England. To express his sympathy with Surgeon-General Jones, Sir William Osler has cabled his resignation to Premier Borden of Canada, and, it is understood, may go to Canada to speak in defense of General Jones.

Colonel Bruce's Report on C. A. M. C. in England.—The report, referred to in THE JOURNAL, October 21, p. 1239, continues to be the topic of discussion in medical circles in Canada, as well as to invite further discussion in the public press. A fuller text of the report is now to hand. It is substantially as follows: A complete reorganization of the medical services is recommended; also that the arrangements in Canada, England Overseas Dominions be coordinated. The report advocates the treatment of Canadian casualties in Canadian hospitals; that Canadian hospitals be concentrated, and all voluntary hospitals be abolished. The care of the Canadian sick and wounded should be the first duty of the Canadian Army Medical Corps. Incapacitated Canadian soldiers should be returned to Canada as soon as they are fit to travel to receive further medical treatment at the established hospitals in Canada. It is recommended that the Red Cross hospitals be taken over and the three Canadian hospitals at Saloniki brought back to England if the imperial authorities can spare them from that eastern base. It is further recommended that 1,000-bed hospitals be established at Halifax, Montreal, Toronto, Winnipeg and Vancouver and a smaller one at Ottawa. In these there should be accommodation for a limited number of officers. Canadian medical officers who have had experience at the front should be brought home to organize these hospitals, and medical boards in different sections of Canada should weed out the unfit before they go overseas. No more medical units should be organized in Canada for overseas duty. There should be a director of medical services and a deputy director on the line of communication in France and another deputy with the C. A. M. C. in France. Assistant directors should be with (Canadian) embarkation, nursing service, records, invaliding and supplies. According to the report of Colonel Bruce's committee, the Canadian wounded soldiers want to be taken to Canadian hospitals, and for that purpose the concentration of these hospitals is recommended. It is stated that, up to the present, Canadian doctors who have gone overseas to treat Canadian soldiers have rarely had that opportunity. The use of voluntary aid hospitals is objected to because of inefficiency and cost. The system of sending casualty cases to hospitals is not good, and when there patients have been kept too long. In many cases it is claimed they could have been returned to Canada or to the firing line. In the handling of certain special diseases the service in England has been unsatisfactory, and when experienced doctors have gone over to England from Canada, in many cases, their services have not been properly engaged.

LONDON LETTER

LONDON, Oct. 9, 1916.

The War

THE WORK OF THE ARMY SURGEONS

The work of the army surgeons in this unprecedented war, which has absorbed almost half the physicians of the country, is as full of danger and thrilling episodes as that of the soldiers. The toll taken from them by death is considerable. During the past three months, fifty-three have been killed, four are missing and 208 have been wounded. In the same period 260 of their ambulance men have been killed and 1,212 wounded. For the battle of the Somme the most careful preparations were made by the medical corps. The commander-in-chief, Sir Douglas Haig, himself superintended the arrangement of the regimental aid posts and casualty clearing stations. The terrific bombardment of the present battles has modified the method of dealing with the wounded. In the early days of the war the regimental aid posts used to be placed in some deserted farm house near the front trench. Today as we advance, no structure of any kind is left standing. The only shelter for the surgeon is one of our own trenches or a captured German trench. For safety the advanced dressing stations are placed underground protected by 4 or 5 feet of earth above them. There in cavernous chambers the work is done by artificial light, and electric torches are necessary to pass through the various windings connecting the underground rooms. From this place the wounded are evacuated as rapidly as possible to the corps collecting station, where each man arrives with his wound dressed and a label on which is written the diagnosis. Here there is a field operating theater, but operations are performed only in cases of urgency. The next stopping point is the clearing station, which is often a large building such as a school or mill transformed into a hospital.

Smallpox Without Eruption

Dr. Willoughby, health officer in the port of London, records an outbreak of smallpox among a family of ten persons who, after a visit to the Holy Land, boarded a homeward-bound vessel at Port Said, and states that it derived special interest from clear evidence of smallpox without eruption in two of the cases. The ship's quartermaster, who had taken the disease from one of the children, had as severe an attack of confluent smallpox as had ever been recovered from. Of the twelve sufferers—the family of ten, and two of the crew—two young unvaccinated children died.

Women in the Medical Schools

As stated in previous letters to THE JOURNAL, the shortage of physicians due to the war has caused an influx of women students into the profession. Previously they were admitted to very few of the ordinary medical schools and had to take their course in one of the few schools formed for training them alone. Now the war has caused several relaxations of regulations. To most of the London hospitals women students are not admitted. At St. George's Hospital, however, during the war a strictly limited number of women students are eligible for admission. In the event of the war coming to an end before such women students are qualified, they will be allowed to continue their studies until qualification. This school was the pioneer among the metropolitan medical schools in opening its doors during the war to women medical students. The council of Charing Cross Hospital recently decided to throw the school and hospital open to women medical students. It has done this because it feels that the medical education of women should be on lines as broad and comprehensive as those enjoyed by men. The dean of the hospital says: "All the learned professions—and medicine not less than another—demand of those who profess them very high ideals and standards of conduct, and these requirements are more likely to be obtained if the students, whether male or female, are educated under identical conditions. Any possible tendency to overestimation of the attainments of the individual is undesirable."

The hospital and school are now open to women on equal terms with men. St. Mary's Hospital, at the request of the Royal Free Hospital, School of Medicine for Women (the

only medical school in London entirely devoted to the training of women students), agreed to take a certain number of women students annually for their clinical course on the same terms and under the same conditions as men. These students were to be drawn exclusively from those who had entered as students at the London School of Medicine for Women and had completed their preliminary and intermediate studies. The scheme has now been in working for four months, and no friction of any kind has arisen. A separate common-room has been provided for the women students, who enjoy exactly the same privileges as the men. King's College, which for some years had women students in its classes for the preliminary medical subjects, lately admitted them to the anatomy department, in the first instance limiting the number to twenty. The final studies of these women students can be taken at Charing Cross, St. George's, and St. Mary's Hospital Medical Schools, in addition to the Royal Free Hospital for Women. It will thus be seen that only one of the great medical schools of London admits women as a matter of principle. At the Royal Free Hospital a great extension of the Medical School for Women has been opened by the queen. The cost was $150,000. It is now possible to give a complete course to 450 students.

The Court of the University of Edinburgh has made a new departure. It has resolved to admit women in the winter session to all the medical classes, systematic and practical, in the university. The systematic lectures in midwifery and gynecology will be given separately to men and women students, and possibly also those in materia medica; but in all other subjects the classes will be mixed. There will be separate sections for women in all practical courses except in advanced courses, and in special cases that may be arranged by the head of the department. Women will be admitted to university clinical instruction as soon as arrangements can be made. They are now under consideration, and it is expected that by next year women students will be able to take their whole curriculum within the university.

PARIS LETTER

PARIS, Sept. 28, 1916.

The War

THE PREVENTION OF DEAFNESS DUE TO EXPLOSIONS

Heretofore attention to disorders of the auditory apparatus caused by nearby explosions of projectiles has mainly been directed to treatment. In a communication to the Académie de médecine, Dr. Wicart of Paris has taken up the question of prophylaxis. According to him, the brutal effect of artillery fire or the bursting of shells may be considerably attenuated if the soldier takes precaution before, during and after the explosion, of swallowing his saliva two or three times while pinching the nostrils. Also, during bombardments and artillery fire he should place in his external auditory meatus a bit of cotton soaked in glycerin and place on his head or ear guards padded with cotton. If these simple and quite efficacious precautions have not been taken owing to the unexpectedness of the explosion, it is still necessary to bear in mind that however violent the traumatism of the auditory apparatus may be, it will have no serious consequences if infection can be avoided. Often such an infection has its origin in a previous one of which the patient was unaware: nasal or pharyngeal catarrh, hypertrophy of the turbinates, obstruction of the eustachian tube, old cicatricial otitis, indurated wax, and cephalic congestion in syphilitics, in malarial patients, in those who are subject to some poisonings (such as lead), and in arthritis. For these reasons the absolute cleanliness of the auricular passages is necessary as an insurance against those permanent infirmities of hearing which too often follow these injuries. Therefore the external meatus should be cleaned and dressed with glycerin, as stated, and camphorated oil with 1 per cent. of eucalyptol or of essence of lavender should be instilled into the nostrils. In the absence of these, mentholated petrolatum may be used, but is much less efficacious. These instillations should be made with the patient lying on his back, the head a little drawn back, in which position the patient should remain for five minutes. In every case men deafened and injured by these explosions ought to receive this first aid in the sanitary formations in order to avoid an infection which might transform a simple shock into suppurative otitis.

MANUFACTURE OF CLINICAL THERMOMETERS FOR THE ARMY

Mr. Justin Godart, undersecretary of state of the health service, has installed at the central pharmacy of the army a workshop for the manufacture of clinical thermometers. The object of this is to form an instructional and educational center for war cripples, who will learn the trade at this factory and then will be distributed over the country in order to create an industry of clinical thermometers, an industry which Germany had almost succeeded in monopolizing.

MEDICAL STUDENTS AND THE WAR

Mr. Justin Godart, undersecretary of state of the health service, has decided to enroll all students of medicine as nurses, even those who have taken only two semesters.

EXTRACTION OF PROJECTILES FROM THE LUNGS

Dr. Marquis has made a communication on this subject to the Réunion médico-chirurgicale de la V-e armée in which he insisted on the possibility of extracting projectiles lodged in the lungs without danger and without causing pain or functional trouble. For this purpose, two methods are available, that of Marion, by fixation of the lung to the pleura, and that of Duval, exteriorization of the lung. The presence or absence of pleuropulmonary adhesions revealed by roentgenoscopy decides the choice. Should they be present, the fixation method is preferable, not only because it respects the adhesions which if broken might bleed, but, especially, because these same adhesions are often the result of the localized infection around the projectile and this method avoids a greater extension of the infection of the pleural cavity. In the absence of adhesions, however, it is better to utilize the method of exteriorization of the lung which is more respectful of the pulmonary tissue, does not cause permanent adhesions between the lung and the pleura, and gives healing by first intention and, therefore, much more rapidly. But in order to obtain from this method the best results of which it is capable, drainage must be avoided. Aspiration of the intrapleural air is not indispensable, the pneumothorax being rapidly absorbed spontaneously. Seven patients with wounds with intrapulmonary projectiles have been operated on by Marquis. In two cases, the projectile was not removed; one because it was not detected in a completely retracted lung, and the other, which was a flat piece of metal, because it was firmly adherent to the pericardium; it was thought better to leave it in place rather than to involve this membrane. In five other cases, the removal of the projectile occasioned no difficulty, although in some it was situated at a great depth. In no case was there any serious complication. There was a slight rise of temperature on the day following the operation, especially with the method of fixation. With the same method also, hemoptysis occurred on the evening and the day after the operation. Finally, in one case, a pleural hemorrhage had to be drained. Marquis concludes that with the reserve that the removal of a projectile adherent to a vital organ should not be obstinately persisted in the extraction of intrapulmonary projectile under conditions of rigorous asepsis serves the double purpose of curing a certain number of wounded and maintaining their efficiency to an appreciable extent.

Poliomyelitis

The Conseil supérieur d'hygiène has had its attention called to the question of poliomyelitis by Mr. Brisac, director of the Hygiène publique at the ministry of the interior. In view of the anxiety to which the epidemic in the United States might give rise in public opinion, Mr. Brisac requested the opinion of the council as to whether it was necessary for the French authorities to take measures to prevent a possible extension of the epidemic to France. Should the answer be in the affirmative, he asked what measures should be taken at the maritime frontiers, and finally, if any cases should occur, what prophylactic measures should be applied. Dr. Netter read a report which concluded that poliomyelitis, long known in France (French scientists, Cornil and Charcot especially, were the first to point out the characteristic lesions of the spinal cord), has caused in France only isolated cases. There is no reason to fear that this disease can acquire in this country an epidemic character. In these circumstances the council is of the opinion that no special measures of precaution need be taken. Nevertheless, the Académie de médecine a few weeks ago passed a resolution that poliomyelitis should be placed on the list of notifiable diseases. The council has, in its turn, approved this proposition. In consequence of this double request, the minister of the interior, to whom the resolution of the council of hygiene has been communicated by Mr. Brisac, will in all probability cause a decree to be issued in the sense desired by the council.

Marriages

JOHN WESTON EMMONS, M.D., Poplar Grove, Ill., to Mrs. Emma Downy of Aurora, Ill., at Rockford, Ill., September 28.

SOPHY ELLEN PAGE, M.D., East Bethany, N. Y., to Rev. Charles Leonard Carlucci of Springfield, Mass., October 5.

DELORME FORDYCE, M.D., Conshohocken, Pa., to Miss Anna R. Beishiag of Philadelphia, in New York, September 30.

WILLIAM SOLOMON JONES, M.D., Jeffersonville, Ga., to Miss Edith Louise Jackman of Menominee, Mich., October 13.

ZADOC LAWRENCE GRIESEMER, M.D., Roselle, N. J., and New York, to Miss Sara L. Crane of New York, October 5.

EDWIN ROBERT WIESE, M.D., Washington, D. C., to Miss Elizabeth Louise Elterich of Pittsburgh, October 11.

ROYAL CORNELIUS VAN ETTEN, M.D., New York, to Miss Louise Greenfield of Rome, N. Y., September 20.

JOHN SIMS HAWKINS, M.D., Cedar Hills, Tenn., to Miss Marion True of Springfield, Tenn., October 4.

MATHIAS AMBROSE WAGNER, M.D., Lima, Ohio, to Miss Stella M. Cable of Sandusky, Ohio, October 9.

JOHN B. FLOYD, M.D., Waverly Hill, Ky., to Miss Barbara L. Lanahan of Louisville, Ky., October 9.

JOHN ALEXANDER MCDONALD, M.D., to Miss Julia Loring Haines, both of Indianapolis, October 24.

EDWIN W. WUTTKE, M.D., Sumner, Iowa, to Mrs. Margaret Young of Des Moines, Iowa, October 12.

ARTHUR FREDERICK SCHUETTLER, M.D., to Miss Matilda Genseka, both of Chicago, October 18.

ROBERT ANDERSON COOKE, M.D., to Mrs. Florence Rogers Turner, both of New York, October 9.

W. FORREST LEE, M.D., Ithaca, N. Y., to Miss Ruth Jane McClelland of Brooklyn, October 14.

KARL F. E. WEGENER, M.D., Exeter, Neb., to Miss Ella Koenig of Lincoln, Neb., October 4.

JOHN MOFFETT LEE, M.D., to Miss Estelle Pearson Jones of Rushville, Ind., September 27.

JOSEPH CHARLES SCAL, M.D., to Miss Lillian D. Kaplan, both of New York, October 5.

ROY S. SUMNER, M.D., to Miss Niram Willett, both of Owensboro, Ky., October 4.

JACOB T. BOWMAN, M.D., to Mrs. Bertha Balme, both of Somerset, Pa., October 3.

Deaths

Louis McLane Tiffany, M.D., Baltimore; University of Maryland, Baltimore, 1868; aged 72; a member and once president of the Medical and Chirurgical Faculty of Maryland and a member of the Medical Society of Virginia; demonstrator of anatomy in his alma mater from 1869 to 1874; professor of operative surgery from 1874 to 1880 and professor of surgery from 1880 to 1902, and since that date emeritus professor of surgery; formerly consulting surgeon to Johns Hopkins and St. Joseph's hospitals, the Church Home and other Baltimore institutions; for fifteen years surgeon in chief of the Baltimore and Ohio System; formerly president of the American Surgical Association and Southern Surgical and Gynecological Society; a surgeon of international note; died at his country home, Mount Custis, Accomac County, Va., October 23, from heart disease.

David Braden Kyle, M.D., Philadelphia; Jefferson Medical College, 1891; aged 53; a Fellow of the American Medical Association and president of the American Laryngological Association in 1910; a member of the American Otological Society, American Laryngological, Rhinological and Otological Society and American Climatological Society; professor of laryngology and rhinology in Jefferson Medical College since 1896; chief laryngologist, rhinologist and otologist to St. Mary's Hospital, Philadelphia, from 1891 to 1893 and since that time holding a similar position at St. Agnes' Hospital; bacteriologist to the Philadelphia Orthopedic Hospital; author of a standard work on diseases of the nose and throat which has gone through five editions; died at his home in Philadelphia, October 23, from pneumonia.

James Stewart Kennedy, M.D., First Lieutenant, M. R. C., U. S. Army; Jefferson Medical College, 1880; aged 59; a Fellow of the American Medical Association, and a member of the Association of Military Surgeons of the United States; formerly captain and assistant surgeon, U. S. V., and acting assistant surgeon, U. S. Army, with service in Cuba and the Philippine Islands; once coroner of Franklin County, Pa.; president of the Chambersburg City Council and county physician; president of the board of health of Selcedo, Samar, P. I., during a cholera epidemic; died in the Walter Reed General Hospital, Washington, D. C., October 7.

William S. Allee, M.D., Olean, Mo.; Missouri Medical College, St. Louis, 1875; aged 64; a Fellow of the American Medical Association; president of the Missouri State Medical Association in 1907, and at the time of his death treasurer of the organization; president of the Miller County Medical Society; for twenty-four years president of the Miller County Exchange Bank, and for four terms a member of the state senate from the twenty-seventh district; died in Wesley Hospital, Kansas City, Mo., October 9, after an operation for intestinal obstruction.

Oleon Clinton Owens, M.D., Covington, Ky.; Jefferson Medical College, 1887; aged 53; formerly a member of the Kentucky State Medical Association; for several years surgeon of the Chesapeake and Ohio Railroad at Maysville, Ky.; a well known alienist; superintendent of the State Home for the Feebleminded, Frankfort, Ky., from 1905 and afterward superintendent of the State Hospital, Lakeland; died at his home, October 8, from the effects of a fracture of the hip sustained two days before in an accident at the Latonia race course.

Walter Milroy Beck, M.D., Clarkfield, Minn.; Medical College of Ohio, Cincinnati, 1886; Jefferson Medical College, 1890; aged 54; a Fellow of the American Medical Association; a member of the hospital corps of the Minnesota regiment which served in the Philippine Islands during the war with Spain; who was injured in an automobile accident, August 20, between Clarkfield and Granite Falls, sustaining a multiple fracture of the skull; died in St. Barnabas' Hospital, Minneapolis, October 10.

Francis Marion Michael, M.D., Eaton, Ohio; Bellevue Hospital Medical College, 1879; aged 67; a Fellow of the American Medical Association; formerly president of the Preble County (Ohio) Medical Society; physician to the Children's Home, Eaton; president of the Preble County board and for several terms a member of the city council; local surgeon of the D. and W. T. Railroad; died at his home, October 8, from cerebral hemorrhage.

Winfield W. McKay, M.D., San Diego, Calif.; College of Physicians and Surgeons, Keokuk, Iowa, 1873; aged 69; formerly a Fellow of the American Medical Association; a member of the Medical Society of the State of California; acting assistant surgeon, U. S. P. H. S., and in charge of the San Diego Quarantine Station at La Playa for twenty-five years past; died at the quarantine station, September 30, from nephritis.

John Shaffer Sprowl, M.D., Warren, Ind.; University of Michigan, Ann Arbor, 1872; aged 66; a Fellow of the American Medical Association and vice president of the Huntington County Medical Society; president of the Warren Telephone Company; died at his home, October 10, from cerebral hemorrhage. At a meeting of the county medical society, October 10, resolutions of regret were unanimously adopted.

Mark D. Weed, M.D., Captain, Medical Corps, U. S. Army; Jefferson Medical College, Philadelphia, 1905; aged 35; a Fellow of the American Medical Association and a member of the Association of Military Surgeons of the United States; was graduated from the Army Medical School in May, 1910, and was promoted to captain in June, 1914; died at his station, Fort Bayard, N. M., September 28, from tuberculosis.

Milton Bennett Titus, M.D., Chicago; New York University, New York, 1881; aged 58; formerly a member of the Illinois State Medical Society and once president of the Allegany County (N. Y.) Medical Society; died in St. Luke's Hospital, Chicago, October 14, from the effects of poison, believed to have been self-administered, with suicidal intent.

Edward G. Hersh, M.D., McComb, Ohio; Cincinnati College of Medicine and Surgery, 1890; aged 50; formerly a Fellow of the American Medical Association; a member of the Ohio State Medical Association and National Association of Railway Surgeons; president of the Hancock County Medical Society; died at his home, October 3.

Clarence A. Rogers, M.D., Cordova, Tenn.; **Memphis** (Tenn.) Hospital Medical College, 1903; University of the South, Sewanee, Tenn., 1906; Vanderbilt University, Nashville, Tenn., 1907; aged 38; died at his home, October 10, from the effects of a gunshot wound of the head, self-inflicted, it is believed, with suicidal intent.

William Boys, M.D., Portland, Ore.; University of Pennsylvania, Philadelphia, 1864; aged 71; formerly a Fellow of the American Medical Association; professor of diseases of women in the medical department of Willamette University, Portland, and gynecologist to the Portland Hospital; died at his home, October 2.

Hayden Austin West, M.D., Sewanee, Tenn.; University of Tennessee, Nashville, 1899; aged 44; formerly a member of the Tennessee State Medical Association; for several years professor of clinical, operative, abdominal and minor surgery in the University of the South, Sewanee; died in an infirmary in Nashville, October 8.

Thomas J. Morton, M.D.; Philadelphia; Jefferson Medical College, 1885; aged 54; for twenty years a member of the Philadelphia City Council and afterward a select councilman; for many years coroner's physician; died at his home, October 12, from pulmonary hemorrhage following an attack of bronchitis.

Charles R. Hart, M.D., Bethel, Conn.; College of Physicians and Surgeons of the City of New York, 1859; aged 79; a member of the Connecticut State Medical Society; surgeon of the Tenth Connecticut Volunteer Infantry throughout the Civil War; died at his home, August 29, from heart disease.

Emmet Alvin Welsh, M.D., Shreveport, La.; University of Maryland, Baltimore, 1887; aged 52; a Fellow of the American Medical Association; pathologist and assistant superintendent of the State Charity Hospital, Shreveport; died October 6, after an operation for acute appendicitis.

Lawrence Yancey King, M.D., Florence, S. C.; Louisville (Ky.) Medical College, 1891; aged 45; a member of the South Carolina Medical Association; while on his way to Richmond, Va., to undergo a surgical operation, died in the station at Richmond, October 1.

Wayne E. J. Bomberger, M.D., Harrisburg, Pa.; Hahnemann Medical College, Philadelphia, 1904; aged 35; died in the Keystone Hospital, Harrisburg, October 6, from typhoid fever, complicated by an acute attack of appendicitis, which necessitated an operation.

Frank Knight Hill, M.D., Rockford, Ill.; New York Homeopathic Medical College, New York, 1875; aged 65; formerly a member of the Illinois State Medical Society; surgeon to St. Anthony Hospital, Rockford; died at his home, October 8, from heart disease.

Robert A. Fitzgerald, M.D., Alton, Ill., formerly of Cairo, Ill.; St. Louis College of Physicians and Surgeons, 1904; aged 42; a member of the Illinois State Medical Society; died in the Missouri Baptist Sanitarium, St. Louis, October 10, from pneumonia.

James R. Thornbury, M.D., Princeton, Kan.; College of Physicians and Surgeons, Keokuk, Iowa, 1878; aged 73; a veteran of the Civil War, and for forty-four years a practitioner of Franklin County; died at his home, about October 2.

Chester H. Latham, M.D., Pecatonica, Ill.; Northwestern University Medical School, Chicago, 1876; aged 64; a member of the Illinois State Medical Society; died at the home of his daughter, in Seward, Neb., October 11, from anemia.

David Paulson, M.D., Hinsdale, Ill.; Bellevue Hospital Medical College, 1894; aged 48; a Fellow of the American Medical Association; founder and superintendent of the Hinsdale Sanitarium; died in Asheville, N. C., October 16.

George Bayliss Stillman, M.D., East Cleveland, Ohio; College of Physicians and Surgeons, Baltimore, 1880; aged 64; formerly a member of the Ohio State Medical Association; died in Buffalo, October 12.

George Gray Wilson, M.D., Cleveland; L.R.C.P., L.R.C.S., Edinburgh; L.R.F.P.&S., Glasgow, 1898; aged 44; died at his home, October 4, from pneumonia.

Lafayette Jones, M.D., St. Johns, Mich.; University of Michigan, Ann Arbor, 1872; was found dead from heart disease, in his home, September 30.

Azariah Paris Cobb, M.D., Del Rio, Texas; Mississippi Medical College, Meridian, Miss., 1912; aged 27; died at his home, October 3.

The Propaganda for Reform

IN THIS DEPARTMENT APPEAR REPORTS OF THE COUNCIL ON PHARMACY AND CHEMISTRY AND OF THE ASSOCIATION LABORATORY, TOGETHER WITH OTHER MATTER TENDING TO AID INTELLIGENT PRESCRIBING AND TO OPPOSE MEDICAL FRAUD ON THE PUBLIC AND ON THE PROFESSION

SOME MISBRANDED NOSTRUMS

RADWAY'S READY RELIEF

Radway's Ready Relief, put on the market by Radway & Co., New York, and admittedly containing 27 per cent. alcohol, was sold under such claims as:

"This remedy will relieve rheumatism, sore throat, pleurisy, pneumonia . . . headache . . .burns and scalds, spinal affections . . . fevers . . . dysentery . . . cholera . . . paralysis."

"Cholera. The Relief is almost a specific in this terrible epidemic; if used in time, will save nearly every case."

"It acts as a preventive against the formation of concretions, gravel, or calculi . . ."

"Radway's Ready Relief . . . is a cure for Rheumatic . . . and Malarious Complaints."

The preparation was analyzed in the Bureau of Chemistry which reported that it was essentially a watery alcoholic solution of oleoresin of capsicum (cayenne pepper), camphor and ammonia. The government officials charged that the

A typical R. R. R. advertisement of the older style.

product was misbranded in that the statements made regarding the curative effects were "false and fraudulent" and were applied "in disregard of their truth or falsity." The company pleaded guilty and was fined $50.—[*Notice of Judgment No. 3704.*]

INGHAM'S VEGETABLE EXPECTORANT NERVINE PAIN EXTRACTOR

H. A. Ingham & Co. of Vergennes, Vt., shipped a quantity of this nostrum in interstate commerce. The Bureau of Chemistry analyzed a specimen of this nostrum and reported that it contained "alcohol, 86 per cent., opium alkaloids, camphor, capsicum and vegetable extractive matter." Some of the claims made for this morphin mixture were:

"For teething and restless children, it is not only safe and harmless, but positively beneficial. . . . If sick it will do good; if well it will do no harm."

"It is . . . perfectly harmless . . ."

It is charged that these statements were "false and fraudulent" and were made "knowingly and in reckless and wanton disregard of their truth or falsity." The concern pleaded guilty and was fined $100.—[*Notice of Judgment No. 3734.*]

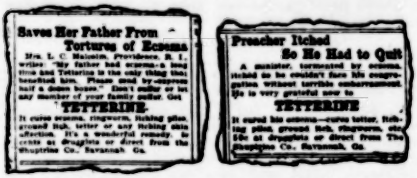
TETTERINE

This ointment, put out by the Shuptrine Company of Savannah, Ga., was sold under such claims as:

"Tetterine, a marvelous remedy for . . . Tetter, Eczema . . . and all contagious, itching Eruptions."

"The greatest of Skin Remedies in Household Use."
"It is impossible to enumerate the great number of skin disorders for which Tetterine is a most pleasant panacea."

Twelve dozen packages of this product were seized by the federal authorities who alleged that the claims made for Tetterine were misleading, false and fraudulent, and that the curative claims made constituted misbranding. The Shuptrine Company would neither admit nor deny the allegation of misbranding but consented to a decree of condemnation and prayed that it be allowed the privilege of reclaiming



the product by giving bond. After the company had paid the costs and furnished a bond in the sum of $250, the United States marshal turned the 12 dozen packages over to it.—[*Notice of Judgment No. 3736.*]

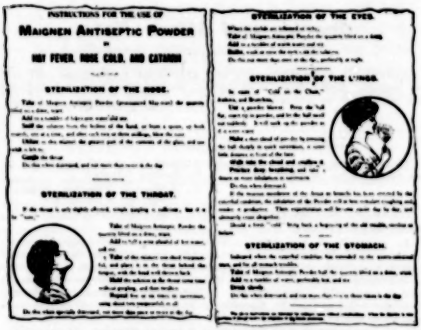
MAIGNEN ANTISEPTIC POWDER

Maignen Antiseptic Powder, put on the market by the Maignen Chemical Company, Philadelphia, was at one time exploited to the medical profession and was exposed in THE JOURNAL.[1] It has since been analyzed by the federal chemists who reported that the product had essentially the following composition:

Calcium carbonate	51 per cent.
Borax, aluminum sulphate and sodium carbonate	49 per cent.

The trade package contained such statements regarding curative effects of Maignen Antiseptic Powder as:

"A perfect Germicide . . ."
"A scientific germicide for external and internal use."


INSTRUCTIONS FOR THE USE OF
MAIGNEN ANTISEPTIC POWDER
HAY FEVER, ROSE COLD, AND CATARRH
STERILIZATION OF THE NOSE.
STERILIZATION OF THE THROAT.
STERILIZATION OF THE EYES.
STERILIZATION OF THE LUNGS.
STERILIZATION OF THE STOMACH.

The exploiters of Maignen Antiseptic Powder tried to persuade the public that the preparation would "sterilize" the stomach, throat, nose, lungs, etc.

There also were a number of directions describing how by the use of this preparation the skin, stomach, throat, nose, lungs, etc., might be "sterilized." The federal officials held that these claims were "false and fraudulent," and declared further that the product "could not effect sterilization." No claimant appeared and the court ordered that the United States marshal should destroy the product.—[*Notice of Judgment No. 3753.*]

GREEN MOUNTAIN OIL OR MAGIC PAIN DESTROYER

The Charles N. Crittenton Company, New York, shipped in interstate commerce a quantity of "Green Mountain Oil or Magic Pain Destroyer." According to the claims made on the trade package, this stuff was said to be:

"A Remedy for Diphtheria, Croup, Deafness and Sore Eyes, Rheumatic Pains, Stiff Joints, Pains in the Back, Side or Breast, Dyspepsia, Asthma, Piles, Burns, Sore Throat, Sprains, Wounds and Bruises, Neuralgia, Croup, Toothache and Headache, Earache and Stiff Neck, Felons, Salt Rheum, Broken Breast, Erysipelas, Chilblains and Frosted Feet. This Oil will relieve all Nervous Complaints."

The federal chemists who analyzed the preparation reported that it consisted essentially of 95 per cent. linseed oil, with oil of sassafras, oil of thuja and oil of turpentine with possibly small amounts of camphor. The Crittenton Company, which was charged with making "false and fraudulent" claims for the preparation "in reckless and wanton disregard of their truth or falsity," pleaded guilty and was fined $100.—[*Notice of Judgment No. 3797.*]

MRS. JOE PERSON'S REMEDY

This preparation was sold by the Mrs. Joe Person Remedy Company of Kittrell, N. C., under such claims as:

"It will absolutely cure blood poison."
"Indigestion and nervousness permanently cured."
"A Sure Cure for Eczema."
"Malaria . . . Chills and Fever . . . a complete cure."
"Pellagra Cured."

The federal chemists analyzed Mrs. Joe Person's Remedy and reported that it was a slightly sweetened water-alcohol solution of vegetable drugs with a minute trace of alkaloids and the presence of podophyllin and sarsaparilla indicated. The libel filed by the federal officials was for the seizure and condemnation of seventeen cases of this nostrum on the ground that the curative claims made "were misleading, false and fraudulent." The company in filing its answer neither admitted nor denied the truth of the material allegations. After payment of costs and executing a bond in the sum of $200, the product was turned over to the company.—[*Notice of Judgment No. 3745.*]

TUTT'S PILLS

The Dr. Tutt Mfg. Company of New York was a trade name used by Brent Good, Harry H. Good and Susan H. Hoyt. Tutt's Pills, put out by this concern, were analyzed by the federal chemists who reported that they consisted mainly of sugar, aloes, starch and calomel. The nostrum was sold under claims to the effect that it was "a remedy for intermittent and remittent fevers, dropsy, dysentery, dis-

eases of the kidneys and bladder, and all disorders that arise from a diseased liver or impure blood; and effective for relieving painful menstruation, and effective for preventing morning sickness peculiar to females." These claims, the federal authorities charged, were "false and fraudulent" and applied "knowingly and in disregard to their truth or falsity." Brent Good, Harry H. Good and Susan H. Hoyt pleaded guilty and each was fined $10.—[*Notice of Judgment No. 3788.*]

1. THE JOURNAL A. M. A., Feb. 15, 1913, p. 537; Nov. 14, 1914, p. 1779.

Correspondence

Colon Bacillus and Gastric Ulcer

To the Editor:—I beg to call your attention to that part of your editorial of July 29 on "Gastric Ulcer and Gastric Acidity" which reads to the effect that it has been asserted that gastric ulcer can be produced quite uniformly in certain species by the intravenous injection of *Bacillus coli*, but Hardt has failed to substantiate this work. Now, if you will refer to Hardt's report of his work, carried on under the supervision of Rosenow, you will observe that gastric and duodenal lesions were produced by him in 100 per cent. of the animals injected with a certain strain of *B. coli*. Although his organism may not have been of the most favorable virulence for producing the most extensive possible lesions, still Strain 4 regularly produced gastric and duodenal erosions and ulcerations. To quote Hardt, "Four rabbits were injected with Strain 4 of *B. coli*, and the results of the injection were as follows:

"A. Rabbit I died in less than four hours after injection. The stomach was perforated at the fundus. There were ulcers and hemorrhages near the pyloric end." Compare this with the first case of my series reported in the Boston *Medical and Surgical Journal*, 1913, clxix, 81, and you will see that the animal died two and one-half hours after injection and showed a large perforation of the stomach, apparently a lysis of the stomach wall.

B. Rabbit II of Hardt's series died in less than twenty-four hours after the injection. "There was an ulcerated area near the fundus, and the intestines showed signs of hemorrhage." Compare this with my second rabbit in the article of the *Lancet-Clinic*, 1914, iii, 88, in which the protocol reads as follows: "Full grown hare injected with 3 c.c. of clumped colon bacilli. The animal was chloroformed twenty-four hours later. The stomach was normal except at the pylorus where there were two hemorrhagic erosions. The intestinal canal was negative except at the rectum, which contained considerable dark blood that probably originated in the erosions."

C. Rabbit III and IV of Hardt's series had hemorrhages in the stomach and hemorrhagic areas in the duodenum. Both were killed forty-eight hours after injection. In comparison, read—Rabbit I in the *Lancet-Clinic* article and Protocols III and V of the *Boston Medical and Surgical Journal* article. A necropsy of Rabbit I was held twenty-two hours after receiving the injection. The stomach showed two erosions at the pyloric ring. The lining of the stomach was thickly covered with digested blood. The rabbit of Protocol V showed hemorrhagic elevations of the duodenum and a suspicious area of dissolution in the mucosa of the wall of the stomach near the pylorus.

In the light of the foregoing comparative results, THE JOURNAL editorial is misleading. Hardt's statements that (1) gastric lesions were produced in every one of the rabbits injected with *B. coli* of Strain 4 and that (2) there is in all probability a difference in virulence and specificity of the toxin produced by *B. coli* are conclusions which should have been incorporated in the editorial.

It may further be stated that Hardt did not repeat all my experiments, which is probably the chief reason (assuming that the colon strain was of proper virulence) for his failure to substantiate all.

EDGAR C. STEINHARTER, M.D., Cincinnati.

The "Biologic" Detail Man

To the Editor:—Twelve or fourteen years ago, when I first began the practice of medicine, it was customary for "detail men" to visit physicians at more or less frequent intervals, distributing samples of various proprietary nostrums and kindly giving advice as to the treatment of certain diseases and the practice of medicine generally. The good work of THE JOURNAL and the Council on Pharmacy and Chemistry has largely eliminated these fellows, and we are practically free from the detail nuisance as we used to know him; but he is with us just the same. He comes nowadays representing some "biologic" concern; but he comes, nevertheless, and he is just as free as ever with his advice and his "buncombe." He kindly tells us poor doctors, who haven't the means of learning otherwise, just how to use this or that serum or vaccine, and just why our results are unsatisfactory and, altogether, sets us right in handling our difficult cases.

To me these men are just as disgusting as the old time nostrum pedlers, and I am finding it more and more difficult to accord them that courtesy which I always try to show visitors to my office.

GEORGE W. WIMBERLY, M.D., Ellensburg, Wash.

Crown Gall and Cancer

To the Editor:—At last I have succeeded in producing small tumors in plants without the use of the crown gall organism (*Bacterium tumefaciens*), that is, simply by means of substances which are by-products of the bacterial growth. The tumors, though small, have been obtained repeatedly on several kinds of plants, and there seems to be no reasonable doubt that they are due to the fleeting chemical stimulus which I have applied. Judging from my experiments, which have been continued for some months, the mechanism of tumor growth appears to be wholly one of changed osmotic pressures brought about by the metabolism of the tumor parasite. A full report will be published later.

ERWIN F. SMITH, Washington, D. C.
Pathologist, Laboratory of Plant Pathology, Bureau of Plant Industry, U. S. Department of Agriculture.

COMMENT.—Previous references to Dr. Smith's work are:

Resemblances of Plant and Tree Cancer to Human Cancer, Miscellany, THE JOURNAL, March 23, 1912, p. 872.
Is Cancer of Infectious Nature? editorial, THE JOURNAL, Aug. 10, 1912, p. 448.
Smith, E. F.: Crown Gall and Cancer, THE JOURNAL, March 11, 1916, p. 833.
Is Cancer of Infectious Nature? editorial, THE JOURNAL, July 8, 1916, p. 123.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

LIME WATER IN INFANT FEEDING

To the Editor:—Has Dr. Holt discontinued the use of lime water in his formulas for modified cow's milk for feeding infants?

E. G. MCKEOWN, Edgerton, Minn.

ANSWER.—Dr. McKeown's letter was referred to Dr. Holt, who replies:

As a result of our investigations on the mineral constituents of woman's and cow's milk, we have reached the conclusion that the great excess of calcium salts shown in cow's milk — even when it is diluted in the usual milk modifications — indicates that any further addition of lime to cow's milk is unnecessary. As lime water is ordinarily employed, I do not believe that the digestibility of cow's milk is affected to any important degree, and have therefore for some years omitted the addition of lime water to milk mixtures as a routine practice. Occasionally, however, under special conditions I still use it, but in much larger proportions than ordinarily employed. These points are now pretty well understood, and generally accepted, in infant feeding.

BACILLUS WELCHII — BACILLUS OEDEMATIS-MALIGNI — BACILLUS CHAUVAEI

To the Editor:—Jordan's "Text-Book of General Bacteriology," 1914, makes the statement that clinically it is not possible to distinguish between emphysematous gangrene (caused by the *Bacillus welchii*) and malignant edema (caused by the *Bacillus chauvaei*). Culturally, from the discussion in the book, one can pick out a few differences. Is there any attempt by any bacteriologist to assert that the two diseases and the bacilli causing them are identical? A. B. M.

ANSWER.—The statement to which our correspondent refers is also repeated in the fifth edition of Jordan's "Text-Book of General Bacteriology," and is based on the discussion of anaerobic infections in the classic work by Ghon and Sachs

(*Centralblatt für Bakteriologie*, 1904, Orig., xxxvi, 200). The statement there made has reference to infections with *Bacillus oedematis-maligni* and not *Bacillus chauvaei*. The latter is the cause of symptomatic anthrax in cattle, a disease which, so far as is known, is not communicable to man. Although the distinctions between the various pathogenic anaerobes are often very subtle, there seems to be general agreement that *Bacillus oedematis-maligni* is quite distinct from *Bacillus welchii*. Consequently no bacteriologist would be likely to assert that the infections were identical, no matter how close the resemblance might be in the clinical picture alone. As is well known, there are many instances in which closely similar, if not identical, clinical symptoms are produced by different pathogenic microbes.

LITERATURE ON OPERATIVE TREATMENT OF EPILEPSY

To the Editor:—Please publish a list of articles in the literature covering operations done, past and present, for epilepsy (exclusive of the jacksonian type), appendicostomy and various abdominal procedures.

W. H. GARDNER, M.D., Pittsburgh.

ANSWER.—In THE JOURNAL, Dec. 25, 1915, p. 2257, appeared a list of articles on "Intestinal Causes of Epilepsy." The following references also concern operative treatment of this disease:

Powers, H., and Labey, F. H.: First Case in Which Abdominal Surgery Was Suggested for Relief of Epilepsy, *Boston Med. and Surg. Jour.*, July, 1916; abstr., THE JOURNAL, Aug. 12, 1916, p. 542.

Holmes, B.: Injury of Head with Oncoming Epilepsy, Negative Abderhalden Reactions, Operation, Drainage Cyst, *Lancet-Clinic*, March 6, 1915.

Bloss, J. R.: Indications for and Prognosis of Surgical Procedures in Epilepsy, *West Virginia Med. Jour.*, September, 1913.

Matthiae, K.: Traumatic Epilepsy and Its Operative Treatment, *Deutsch. Ztschr. f. Chir.*, August, 1913; abstr., THE JOURNAL, Oct. 11, 1913, p. 1414.

Rauch, F.: Operative Treatment of Epilepsy, *Beitr. z. klin. Chir.*, July, 1913.

Rasumowsky, W. J.: Operative Treatment of Cortical Epilepsy, Traumatic and Non-Traumatic, *Arch. f. klin. Chir.*, July 26, 1913.

Kukula, O.: Surgical Treatment of Epilepsy, *Med. Press and Circular*, July, 1913.

Munson, F. F.: End-Results of Head Surgery in Epilepsy, *New York State Jour. Med.*, November, 1912; abstr., THE JOURNAL, Dec. 14, 1912, p. 2187.

Shap, E. A.: Indications for Surgical Intervention in Epilepsy, *New York State Jour. Med.*, November, 1912; abstr., THE JOURNAL, Dec. 14, 1912, p. 2187.

Tilmann, O.: Operative Treatment of Epilepsy, *München. med. Wchnschr.*, Dec. 3, 1912.

Collier, G. K.: Practical Results of Surgery in Epilepsy, *New York State Jour. Med.*, November, 1912.

Curtis, R. M.: Case of Trephining in Epilepsy, *Australasian Med. Gaz.*, July 6, 1912.

Ryan, W. A.: Surgery in Epilepsy, *Southern Med. Jour.*, May, 1912; abstr., THE JOURNAL, May 25, 1912, p. 1640.

Doberer: Operative Treatment of Epilepsy, *Wien. klin. Wchnschr.*, Feb. 29, 1912; abstr., THE JOURNAL, April 13, 1912, p. 1160.

Taylor, W. J.: The Surgical Treatment of Epilepsy, THE JOURNAL, March 30, 1912, p. 967.

INTRAVENOUS ADMINISTRATION OF SODIUM SALICYLATE —VENARSEN—BANNERMAN'S SOLUTION

To the Editor:—I am particularly interested in data concerning the intravenous administration of salicylate of soda, guaiacol and glycerin in arthritis.

What contraindications are there to the administration of it? What has been found to be the dose for the average weight patient, say 170 pounds, and what untoward results have been obtained from the administration of it?

I should like also the same data with reference to Venarsen and Bannerman's Solution. Are any two of these incompatible or would the administration of two or more of them in one dose be contraindicated or cause untoward results?

If you care to answer through THE JOURNAL, I may be known as a MEDICO.

ANSWER.—Sodium salicylate is absorbed rapidly and acts promptly when given by mouth. Intravenous administration, therefore, seems uncalled for, particularly since it does not avoid the gastric side effects of the salicylates, which are due to stimulation of the vomiting center (Eggleston and Hatcher: *Jour. Pharmacol. and Exper. Therap.*, 1915, vii, 225). The intravenous method is said to be painful, and renal irritation has been observed following the injection of 5 gm. of the salicylate. There appears to be no reason for administering guaiacol intravenously, either alone or in combination with sodium salicylate.

From reports of the Council on Pharmacy and Chemistry on Venarsen (THE JOURNAL, May 22, 1915, p. 1780; Propaganda for Reform, Ed. 9, p. 212) and Bannerman's Intravenous Solution (THE JOURNAL, Jan. 2, 1915, p. 70; Propaganda for Reform, Ed. 9, p. 105) it will be seen that both are irrational preparations. Their employment, singly or together, is unwarranted.

Medical Education and State Boards of Registration

COMING EXAMINATIONS

ARKANSAS: Regular, Little Rock, Nov. 14. Sec., Dr. T. J. Stout, Brinkley; Homeopathic, Little Rock, Nov. 13. Sec., Dr. Scott C. Runnels, 900 Scott St., Little Rock; Eclectic, Little Rock, Nov. 14. Sec., Dr. C. E. Laws, 712 Garrison Ave., Fort Smith.

CONNECTICUT: Regular, New Haven, Nov. 14-15. Sec., Charles A. Tuttle, 196 York St., New Haven; Homeopathic, New Haven, Nov. 14-15. Sec., Dr. E. C. M. Hall, 82 Grand Ave., New Haven; Eclectic, New Haven, Nov. 14. Sec., Dr. T. S. Hodge, 19 Main St., Torrington.

FLORIDA: Regular, Palatka, Dec. 5-6. Sec., Dr. E. W. Warren, Palatka; Homeopathic, Jacksonville, Nov. 10. Sec., Dr. J. B. Griffin, St. Augustine.

LOUISIANA: New Orleans, Nov. 30-Dec. 2. Sec., Dr. E. L. Leckert, 716 Macheca Bldg., New Orleans.

MAINE: Portland, Nov. 14-15. Sec., Dr. Frank W. Searle, 776 Congress St., Portland.

MASSACHUSETTS: Boston, Nov. 14-16. Sec., Dr. Walter P. Bowers, Room 501, No. 1 Beacon St., Boston.

MISSISSIPPI: Jackson, Oct. 24-25. Sec., Dr. J. D. Gilleylen, Jackson.

MISSOURI: Jefferson City, Nov. 14-16. Sec., Dr. J. A. B. Adcock, Jefferson City.

NEVADA: Carson City, Nov. 6. Sec., Dr. S. L. Lee, Carson City.

OHIO: Columbus, Dec. 5-7. Sec., Dr. Geo. H. Matson, State House, Columbus.

RHODE ISLAND: Providence, Nov. 15-16. Sec., Dr. Gardner S. Swarts, 70 Waterman St., Providence.

SOUTH CAROLINA: Columbia, Nov. 14. Sec., Dr. A. Earle Boozer, 1806 Hampton St., Columbia.

TEXAS: Fort Worth, Nov. 14-16. Sec., Dr. J. S. McCelvey, Temple State Bank Bldg., Temple.

WEST VIRGINIA: Parkersburg, Nov. 14. Sec., Dr. S. L. Jepson, State Health Commissioner, Charleston.

Utah January Report

Dr. G. F. Harding, secretary of the Utah State Board of Medical Examiners, reports the written examination held at Salt Lake City, Jan. 6-7, 1916. The total number of subjects examined in was 19; total number of questions asked, 100; percentage required to pass, 75. The total number of candidates examined was 2, both of whom passed. Two candidates were licensed through reciprocity. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent.
Rush Medical College		(1915)	83.9
University of Oklahoma		(1915)	82

College	LICENSED THROUGH RECIPROCITY	Year Grad.	Reciprocity with
Tulane University of Louisiana		(1909)	Louisiana
Missouri Medical College		(1882)	Missouri

Utah April Report

Dr. G. F. Harding, secretary of the Utah State Board of Medical Examiners, reports the written examination held at Salt Lake City, April 5-6, 1916. The total number of subjects examined in was 19; total number of questions asked, 100; percentage required to pass, 75. The total number of candidates examined was 3, all of whom passed. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent.
Chicago College of Medicine and Surgery		(1915)	78.5
Johns Hopkins University		(1912)	*
University of Oklahoma		(1915)	*

* No grade given.

Arkansas Eclectic May Report

Dr. C. E. Laws, secretary of the Arkansas Eclectic Medical Board, reports the written examination held at Little Rock, May 9-10, and Fort Smith, May 15-16, 1916. The total number of subjects examined in was 12; total number of questions asked, 120; percentage required to pass, 75. The total number of candidates examined was 21, of whom 17 passed and 4 failed. Two candidates were licensed through reciprocity. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent.
Georgia College of Eclectic Med. and Surg.		(1916)	75.3, 75.8, 90.7, 93.8, 96.7
Kansas City College of Medicine and Surgery		(1916)	78.1, 79, 79.1, 80.2, 81.1, 81.6, 81.6, 82.1, 83.6, 84.1, 85.1, 88.4
	FAILED		
California Eclectic Medical College		(1909)	70.2
Georgia College of Eclectic Med. and Surg.		(1916)	63.1, 67.7, 74.2

LICENSED THROUGH RECIPROCITY

College	Year Grad.	Reciprocity with
California Eclectic Medical College	(1903)	Nevada
Georgia College of Eclectic Medicine and Surgery	(1912)	Georgia

Michigan June Report

Dr. B. D. Harison, secretary of the Michigan State Board of Registration in Medicine, reports the written examination held at Ann Arbor, June 19-21, 1916. The total number of subjects examined in was 14; total number of questions asked, 100; percentage required to pass, 75. The total number of candidates examined was 74, of whom 72 passed and 2 failed. One candidate was granted a reregistration license. The following colleges were represented:

College	Year Grad.	Per Cent.
PASSED		
Yale University	(1916)	89.5
Northwestern University	(1916)	88.4, 89.9
University of Illinois	(1916)	91
Tulane University of Louisiana	(1905)	83.6
Detroit College of Med. and Surg.	(1916)	83
University of Michigan Medical School (1916) 82.5, 82.7, 82.7, 82.8, 83.2, 83.4, 83.6, 83.6, 84.2, 84.3, 84.3, 84.8, 84.8, 85.1, 85.2, 85.4, 85.4, 85.4, 85.5, 85.7, 85.9, 85.9, 86.1, 86.4, 86.5, 86.6, 86.9, 87.2, 87.3, 87.3, 87.6, 87.6, 87.6, 87.7, 87.8, 87.9, 88, 88, 88.1, 88.2, 88.3, 88.6, 88.7, 88.8, 88.9, 88.9, 89, 89.4, 89.6, 89.8, 90, 90, 90.2, 91.5.		
University of Michigan Homeo. Med. School (1916) 81.6, 83.3, 86, 86.1, 86.7, 87.1, 88.7.		
University of Buffalo	(1915)	82.4
University of Cincinnati	(1916)	85.4
Jefferson Medical College	(1916)	88.5
Vanderbilt University	(1915)	89.9
University of Jassy, Roumania	(1904)	81.5
FAILED		
Central Medical Coll. of St. Joseph	(1902)	38.4
Vanderbilt University	(1915)	82.9*

* Fell below the required average in one subject.

Missouri June Report

Dr. J. A. B. Adcock, secretary of the Missouri State Board of Health, reports the oral and written examination held at St. Louis, June 12-14, 1916. The total number of subjects examined in was 14; total number of questions asked, 100; percentage required to pass, 75. The total number of candidates examined was 126, of whom 117 passed and 9 failed. The following colleges were represented:

College	Year Grad.	Total No. Licensed
PASSED		
Bennett Medical College	(1915)	2
Chicago College of Medicine and Surgery	(1916)	3
Coll. of Phys. and Surgs., Chicago	(1905)	1
Loyola University	(1916)	1
Northwestern University	(1915)	1
University of Illinois	(1915)	1
University of Louisville	(1909)	1
Johns Hopkins University	(1915)	2
Harvard University	(1915)	1
Missouri Medical College	(1888)	1
National Univ. of Arts and Sciences	(1916)	50
St. Louis University	(1916)	34
Washington University	(1916)	13
Ohio State Univ. Coll. of Med.	(1916)	1
Meharry Medical College	(1916)	2
University of Tennessee	(1916)	1
University of West Tennessee	(1915)	1
University of Texas	(1916)	1
FAILED		
St. Louis Coll. of Phys. and Surgs.	(1910)	1
National Univ. of Arts and Sciences	(1916)	4
Meharry Medical College	(1915)	2
Univ. of West Tennessee	(1914) (1915)	2

LICENSED THROUGH RECIPROCITY

Twenty-eight candidates were licensed through reciprocity from Jan. 1 to July 1, 1916. The following colleges were represented:

College	Year Grad.	Reciprocity with
University of Colorado	(1907)	Colorado
Atlanta Coll. of Phys. and Surgs.	(1909)	Georgia
Bennett Medical College	(1914)	Illinois
Chicago Coll. of Med. and Surg.	(1911) (1912) (1913, 2)	Illinois
Hahnemann Med. Coll. and Hosp., Chicago	(1896) (1900)	Kansas; Michigan.
Northwestern University	(1902)	Kansas
Rush Medical College	(1901) Iowa; (1912)	Illinois
College of Phys. and Surgs., Chicago	(1912)	Illinois
Drake University	(1913)	Iowa
Sioux City Coll. of Medicine	(1900)	Nebraska
University of Kansas	(1906) (1907)	Kansas
Kentucky University	(1903)	Indiana
Louisville Medical College	(1878)	W. Virginia
University of Louisville	(1911)	Indiana
University of Michigan Medical School	(1907)	Michigan
Barnes Medical College	(1906) Illinois; (1910) Oklahoma; (1911) Tennessee.	
Kansas City Hahnemann Med. Coll.	(1914)	Kansas
John A. Creighton Medical College	(1913)	Kansas
University of Pennsylvania	(1907)	Penna.

Book Notices

CEREBELLAR ABSCESS. Its Etiology, Pathology, Diagnosis and Treatment, Including Anatomy and Physiology of the Cerebellum. By Isidore Friesner, M.D., Adjunct Professor of Otology, and Alfred Braun, M.D., F.A.C.S., Assistant Aural Surgeon, Manhattan Eye, Ear and Throat Hospital. Cloth. Price, $2.50 net. Pp. 186, with 26 illustrations. New York: Paul B. Hoeber, 1916.

The progress made recently in knowledge of the cerebellum, especially in its relation to the vestibular system, makes a book on the subject of cerebellar abscess, presented in the light of the latest researches, timely. The authors, both otologists, limited themselves in the clinical part of their work to a consideration of cerebellar abscess. The book, however, is much more comprehensive. It includes chapters on the anatomy and physiology of the cerebellum, a chapter on the symptomatology of cerebellar abscess, and a discussion of the diagnostic methods employed to distinguish cerebellar from labyrinthine diseases which apply equally well to other lesions of the cerebellum.

Original photographs and illustrations help to make the reading matter easily intelligible. While the volume is small, details are not omitted. The chapter on the anatomy of the cerebellum describes all the known fiber tracts which pass to and from the cerebellum, as well as those which are connected with Deiter's complex. The chapter on the pathology of cerebellar abscess discusses with creditable thoroughness the modus operandi in the spread of infection from the middle ear to the cerebellum, and the same is true of the chapters on the symptomatology and treatment of cerebellar abscess. The chapter on the physiology of the cerebellum, while perhaps too brief and not commensurate with the magnitude and importance of the subject, answers the purpose.

The book makes available for the first time in the English language, a detailed description of the theory and technic of the past-pointing test as worked out by Bárány.

Generally speaking, the book may be said to be in accord with our present state of knowledge. Attention should be called, however, to a few possible exceptions. The authors describe forced movements, vertigo and nystagmus as phenomena resulting from lesions of the cerebellum itself, the latter two symptoms as resulting from the interruption of the vestibulocerebellar tracts. This seems to vary from present general opinion. Vertigo is cerebral in origin and entirely independent of the cerebellum. It may be produced (galvanic vertigo) after complete extirpation of the cerebellum, as shown experimentally by Purkinje and Hitzig. Forced movements, in the light of recent research, are likewise independent of the cerebellum. They are produced by the interruption of the centrifugal or centripetal vestibulomesencephalic tracts in the posterior longitudinal bundle and their prolongation into the central nuclei of the cerebrum. In speaking of forced movements, the authors mention falling to the side, curvature of the trunk and extension of the limbs, phenomena which are but seldom designated that way, and take no cognizance of the most impressive form of such movements, namely, the rolling movements and circus movements. The latter phenomena cannot be explained by the assumption that "the tonic impulses on the normal side predominate and thus produce the forced movements" (pp. 53 and 58). Section of the posterior roots resulting in hypotonicity on the side of the lesion may be followed by stumbling and falling of the animal—and this without reference to the side of the lesion—but never by rolling movements. The forced movements, the rolling movements and circus movements as well as their minor forms, such as conjugate deviation of the head and eyes, and skew deviation (the Hertwig-Mejendic squint) are now looked on as dynamic, and not as paralytic, phenomena. They are the expression of disturbances in spatial orientation, in which consciousness of the direction toward which the movements take place becomes predominant, and seem to be allied to vertigo, essentially a sense of rotatory movement. Like vertigo, they have their origin above the brain stem, and are totally independent of the cerebellum of its afferent and efferent tracts.

The chapter on the anatomy of the cerebellum might have perhaps with advantage omitted a description of the fiber tracts, direct or indirect, from the posterior columns (and their nuclei) to the cerebellum. The existence of these tracts is denied by the researches of Mott, Sherrington, Tooth, Van Gehuchten and Bruce, and confirmation is lent to their studies by our knowledge of the function of these tracts as worked out by Petrén, Head and others. These tracts, it appears, subserve the sense of pressure, the recognition of the size, shape and form of objects, and the appreciation of the point of contact. These sensations are, however, never disturbed in lesions of the cerebellum.

The book is based on the reports of eighty-six cases of cerebellar abscess, collected from the literature since 1906. It is noteworthy that optic neuritis, which is practically constant and intense in cerebellar tumors, has been noted in only fourteen out of the eighty-six cases of cerebellar abscess reported. This is all the more remarkable in view of the fact that the other symptoms of intracranial pressure, such as headache, vomiting, vertigo and bradycardia, have been observed with comparative frequency.

THE PROBLEMS OF PHYSIOLOGICAL AND PATHOLOGICAL CHEMISTRY OF METABOLISM FOR STUDENTS, PHYSICIANS, BIOLOGISTS AND CHEMISTS. By Dr. Otto von Fürth, Professor Extraordinary of Applied Medical Chemistry in the University of Vienna. Translation by Allen J. Smith, Professor of Pathology, University of Pennsylvania. Cloth. Price, $6. Pp. 667. Philadelphia: J. B. Lippincott Company, 1916.

Von Fürth's original work, published as a series of lectures in Germany three or four years ago, was at once recognized as a masterly survey of the many puzzling problems in the difficult but fascinating field of biochemistry. The judicial, logical, clear cut reasoning, and especially the lucid and stimulating presentation, stamped the work as a model of its kind and one which was certain to have a powerful influence in the development and broadening of interest in physiologic and pathologic chemistry. The translator and the publisher have done a distinct service for medicine in making this valuable work available to a great number of readers who otherwise would not have become acquainted with it. Von Fürth's "Probleme" may be looked on as an extension and revision to date of the field covered in von Noorden's work on metabolism, the translation of which noticeably stimulated American medicine. The original work consisted of two volumes, the first discussing especially the chemistry of tissues, the second dealing with normal and pathologic metabolism. Only the second volume, obviously of greater immediate interest to physicians, has been translated. The subjects covered include digestion, autolysis, urinary constituents, purin metabolism and gout, carbohydrate metabolism and diabetes, fat metabolism and obesity, acetone bodies and acidosis, nutrition, fever, and oxidative processes. Probably no other work considers the present state and future possibilities of these topics so well and at the same time so readably. The translator has succeeded well in rendering the easy, interesting style of the lecturer into English. In spite of a statement to the contrary, it would seem that the necessary annotations to bring the work quite up to date would have added to its value. Von Fürth shows an excellent familiarity with the work of biochemistry done in this country.

THE PATHOLOGY OF TUMORS. By E. H. Kettle, M.D., B.S., Assistant Pathologist, St. Mary's Hospital Medical School. Cloth. Price, $3. Pp. 224, with 126 illustrations. New York: Paul B. Hoeber, 1916.

This book gives a straightforward account of tumor pathology as understood at the present day. Its attitude in regard to all disputed and unsettled problems is safe and sane, and it gives as much information as is possible in the brief limit of the volume. The entire sum of our knowledge of tumor pathology is so great as to require many large volumes for its full presentation, as is demonstrated by the massive works of Borst and Wolff. For those wishing a concise, readable and thoroughly trustworthy discussion of tumors, Dr. Kettle's small treatise can be recommended without reservation. One entertaining misprint under Figure 71 shows a psammoma with many "lamented psammoma bodies."

Miscellany

THE IMPORTANT FACTOR IN DEALING WITH TUBERCULOSIS

GEORGE THOMAS PALMER, M.D.
President of the Illinois State Association for the Prevention of Tuberculosis; Director of the Springfield Open Air Colony
SPRINGFIELD, ILL.

If I were asked to write the most significant chapter on the treatment and the prevention of tuberculosis, it would be this chapter. If I were asked to set forth the most important truth regarding the disease for the consideration of the layman, the sociologist, the physician and the purely scientific man, that chapter would have nothing to do with bacteriology, serums, vaccines, climate, outdoor living or diet. If I dealt with pathology at all, I should ignore the lungs, the glands and other structures ordinarily affected by tuberculosis, and should dwell on the weakness, if not the pathology, of the human mind. On that—on mental instability and moral unreliability—I should place the blame for the distressing and tremendously costly delay in adequately meeting the tuberculosis problem.

If the mental—the human side of tuberculosis, could be effectively presented to our learned, deliberative bodies of medical men, it would go farther toward obtaining early diagnosis and accurate treatment than all of the purely scientific lore we now possess.

No stone must be placed in the way of those who laboriously seek the one great specific; but a clear understanding of the conditions which perpetuate the disease and which stand in the way of successful treatment is more important today than all of the learned facts obscured by the technical verbiage of our modern alchemists. The scientific contribution to tuberculosis has been enormous; but the real warfare against the disease will not be fought in the laboratory. The places in which it must be fought out are in the public schools, in the streets, in the homes, in the doctors' offices, in the churches, in the secrecy of the closets in which men search their souls and struggle with their consciences. There must be a thorough course of mental and moral education in which both physicians and laymen should occupy the students' benches. Our present knowledge of diagnosis and treatment, limited though it may be, is adequate for a reasonably successful warfare against the disease, if physicians and people were ready to accept that knowledge and act on it.

How to bring about this moral and intellectual awakening among medical men and the people should have an important place on the programs of the most learned and serious-minded medical societies of the nation, simply for the reason that it has more to do with the cure of disease and the saving of human life than any other problem they can consider.

It is the custom of scientific men, in presenting facts and theories for the consideration of their confrères, to support their contentions with case histories. Perhaps when this simple and tremendously important truth is said before the councils of physicians, it will be supported by such histories as these, which have been taken from the records of my cases during a period of two weeks:

REPORT OF CASES

CASE 1.—*History.*—A railroad man, aged 48, married and father of four young children, had pneumonia three times, the last time (December, 1915) remaining ill for three months. In 1900 he was "down with chills" and completely lost his voice for three months. He had coughed for the past seven months (since last pneumonia) and produced large amounts of sputum. The normal weight was 180; present weight, 131; temperature, 99.6; pulse, 100. The sputum contained tubercle bacilli. There was dulness in both apexes with moist rales. The diagnosis of moderately advanced tuberculosis plus was rendered indisputable by sputum examination. All facts were laid frankly before the patient.

Human or Mental Phase.—The patient was unable and unwilling to enter a sanatorium, although assistance was offered. When a nurse was sent to arrange living conditions for him at home, he refused her services, and declared that the diagnosis was wrong and that he would continue to work. When urged to consult another competent physician to confirm the diagnosis, he refused to do so. He would receive no suggestions as to coughing, disposal of sputum or protection of his

wife and family. Finally he admitted that he had seen another physician who advised him "to settle up his affairs as he had only a short time left to work."

Causal Factors of Present Hopeless Condition.—1. Delay in diagnosis, which was so late (probably sixteen years too late) that outlook was discouraging at best. 2. Hopelessness of prognosis made by last physician. 3. Lack of knowledge of tuberculosis, and mental strabismus on the part of the patient.

CASE 2.—*History.*—A man, aged 24, had lost weight, and complained of poor appetite and constant weariness. Finally while working, he had a slight hemorrhage. The young man attributed this to his throat, and in this his physician agreeably acquiesced. The general condition was such that suspicion was aroused sufficiently to have a sputum specimen examined. There were no bacilli present in the first specimen. A second was not taken. Growing weaker, the young man asked for a vacation, and suggested that he go into camp with the state militia, of which he was a member. In this he was encouraged by his physician on account of the exercise and fresh air in a tent (!). During the first evening in camp, the boy had a profuse hemorrhage. Diagnosis of moderately advanced pulmonary tuberculosis was made by a consultant who was called in after the general alarm caused by the second hemorrhage, and the boy was placed in a sanatorium.

Human or Mental Phase.—While strongly suspecting he was tuberculous, this young man persistently refused to see any physician especially familiar with tuberculosis. He said he did not want to be *told* he had the disease. An interesting question arises in the attitude of the physician in (*a*) agreeing with the patient's very improbable explanation of his first hemorrhage; (*b*) being content with one sputum specimen in a case highly suspicious, and (*c*) concurring in the exceedingly injudicious course of exercise of militia camp life for a tuberculous person. This young man was saved from the hopeless stage by fortunately having a profuse hemorrhage early in his misguided course.

CASE 3.—*History.*—A man, aged 26, single, chauffeur, with no relatives or close friends in this country, had steadily lost ground since 1914, when he had a severe attack of measles. He had pleurisy with effusion two months ago; indigestion for a year or more, and took cold easily. He had lost 17 pounds in the last six months; his voice was husky; appetite finicky; he vomited on coughing; he had coughed for two months; there was pain in the left chest; the temperature was 101, pulse 90; the sputum contained tubercle bacilli; chest findings were very slight. He had chest examination a short time before and physician stated "no diagnosis; but certainly *not* tuberculosis." A diagnosis of moderately advanced tuberculosis, plus, was made, and the patient was sent home and to bed.

Human and Mental Phase.—When a nurse visited this patient to arrange for sanatorium care, the patient had gone to work, denying absolutely that he was tuberculous. Another physician had confirmed the patient's own diagnosis of "bronchitis and stomach trouble" (!). The patient stated that he had come to the dispensary merely to prove that he did not have lung trouble. He deeply resented the diagnosis of tuberculosis, and now does not speak to the physician who made that diagnosis. Persons for whom this boy worked "hardly thought it likely that he had tuberculosis," and said that "even if so, the exercise of caring for the car outdoors would be beneficial." It may be noted that these are educated and generally intelligent people.

Causal Factors in Present Hopeless Condition.—1. Delay in diagnosis, which should have been made two years ago. 2. Ignorance and mental squint on the part of the patient. 3. Opinion of the first physician that the case was not tuberculous, and willingness of the last physician to concur in the obviously absurd self-diagnosis of "bronchitis and stomach trouble." 4. Ignorance of "educated" employers that outdoor exercise can be safe for a tuberculous person carrying a high temperature. This young man will doubtless die.

CASE 4.—*History.*—Woman, aged 16, clerk in department store, had a severe attack of grip a few months before followed by pleurisy. She had lost weight and complained of weariness and nervousness since the grip attack. Her voice was husky at times; there was a hacking cough, particularly after meals, and a moderate quantity of sputum containing tubercle bacilli. There was pain in the left side at the seat of previous pleurisy. Temperature was 100; pulse, 112. Chest findings were slight. There was muscle spasm in the left upper back. A diagnosis of moderately advanced pulmonary tuberculosis was made indisputable by the presence of bacilli in the sputum.

Human and Mental Phase.—This young woman is engaged to be married and, on account of feeling so bad had asked for her vacation early so that she could take a two-week automobile trip over dusty, Illinois roads. The girl was told that she must go to bed outdoors at once and was told that she would be seriously ill with tuberculosis if she did not do so. A nurse was to have been sent to arrange the details of her living. The following day the girl's father, a bartender, called over the telephone, stated that the nurse need not come; that, in his opinion, the girl did not have tuberculosis, and that he had advised her to go on the automobile trip originally proposed. The attitude of patient and father was resentful. The girl will probably die.

Causal Factors in Present Hopeless Condition.—1. The mental attitude of the patient and parents, denying the unquestioned presence of tuberculosis, and resenting the diagnosis. This is a very common feeling among people, even of considerable education. It must be overcome by publicity, in which the family physician must take an active part.

CASE 5.—*History.*—A man, aged 43, train dispatcher, father of three young children, whose father died of "complication of diseases," suffered from "rheumatism of the left shoulder" for a considerable length of time and, one year before, had a profuse hemorrhage. It was diagnosed by the attending physician as "nontuberculous bronchial hemorrhage." The patient continued at work without objection from the physician. Six months after the initial hemorrhage, there was a well established cough with profuse sputum, at times streaked with blood, and there were periods of definite hoarseness. The patient had been steadily losing ground. No sputum specimen was examined. Following a second hemorrhage with chill and fever, six months after the first hemorrhage, the patient stopped work because he was physically unable to continue. No diagnosis was made or, what is equivalent, none was announced to the patient or to members of his family. Another physician was employed who made a diagnosis of pulmonary tuberculosis and ordered the patient to sleep outdoors, to take milk and eggs, and *to work in the garden.* He also administered tuberculin. The patient was hemorrhagic and had high temperature at the time. The actual diagnosis was advanced pulmonary tuberculosis, very active.

Human and Mental Phase.—This patient is reasonable and intelligent; he accepted the actual diagnosis calmly and settled down to a prolonged period of rest in bed without discussion. He expressed regret that he had not known his actual condition sooner.

Causal Factors in Present Hopeless Condition.—1. Failure of physician to advise patient of diagnosis at least one year before breakdown. 2. Permission of patient to work after the first pulmonary hemorrhage. 3. Permission of patient to work in the garden after breakdown, and when hemorrhagic and having fever. 4. Administration of tuberculin when patient had a tendency to hemorrhage and had elevated temperature.

CONCLUSIONS

1. The most important factors in meeting the tuberculosis problem—with which only the prevailing carelessness of diagnostic methods can compare—are the mental attitude of many laymen and the moral and mental attitude of many physicians toward the disease.

2. There is a decided tendency to make self-diagnoses and to deny a diagnosis disagreeable to them on the part of laymen otherwise ordinarily intelligent.

3. Aside from the lack of knowledge as to making the diagnosis, which is, in a way, excusable, there is a tendency on the part of many physicians to do one of several things wholly inexcusable.

(*a*) To make examinations so superficial and hasty in character that they are useless, regardless of the knowledge and skill of the examiner.

(*b*) To make negative diagnosis based on such wholly inadequate examinations.

(*c*) To make false or deceptive and obviously absurd diagnoses—"weak lungs," "threatened lung trouble," etc.—for the purpose of lulling the patient to a false sense of security.

(*d*) To concur in the obviously ridiculous self-diagnosis of patients for the purpose of retaining their friendship or patronage.

4. There is also an astonishing lack of appreciation of the danger from the employment of exercise or tuberculin in those cases in which there is any degree of disease activity. It is possible that more harm is done by the use of tuberculin in the wrong class of cases than there is good from its use in the right class of cases. It is likely that more harm is being done by exercise than there is good accomplished by open air life.

Recovery of Adult from Meningitis After Intraventricular Injection of Antimeningitis Serum

Verbizier and Chauvel report a case of epidemic meningitis of the "walled off" type, in a man of 43. Intraventricular injection of the antiserum was followed by recovery—the first case of which they know in an adult. They cite three successful cases in children on record. The fact that the antiserum injected into the spinal cavity was not being absorbed first gave warning of obstructive trouble. Its nonabsorption was manifest from the persisting yellow tint of the cerebrospinal fluid, this xanthochromia being an important sign of obstruction of communication. Another sign of this was that the pressure in the fluid drawn by repeated lumbar puncture was much less each time. The inefficacy of the intraspinal injections of the antiserum and the abrupt aggravation of the general symptoms confirmed the assumption that the meningococci were not being reached by the antiserum. Still another sign was the fact that the patient did not have severe headache during and after the lumbar puncture, as headache is almost inevitable with lumbar puncture in meningitis, probably from change in the pressure in the ventricles as fluid escapes from the lumbar puncture opening. In the case reported the meningitis was at the seventh day when the signs

above described demonstrated that other measures must be resorted to. Under general anesthesia a semicircular incision was made in the upper part of the frontal bone, a little to the left of the median line, the convexity toward the back. A lumbar puncture needle was then pushed into the brain, slanting inward, toward the right auditory canal. At a depth of 5 cm. an aspirating syringe was attached and about 20 c.c. of a colorless fluid was withdrawn, and a corresponding amount of warm antimeningitis serum was injected and the flap sutured. The fluid contained innumerable meningococci. Gradual improvement followed to recovery in about two weeks. The only complication was retention of urine after the operation on the brain. Catheterization became necessary and led to slight and transient cystitis which soon yielded to the usual measures and clinically normal conditions were restored. The case is described in minute detail in the *Bulletins et mémoires de la Société médicale des hôpitaux de Paris*, 1916, xxxii, 1138.

Medicolegal

Powers of Health Officers and Boards of Health — Requiring Vaccination

(Board of Trustees et al. vs. McMurtry et al. (Ky.), 184 S. W. R. 390)

The Court of Appeals of Kentucky affirms a judgment dismissing the petition of the plaintiffs in this suit, which was brought by the board of trustees of the Highland Park graded common school district No. 46 and others against the members of the county board of health of Jefferson County and the county health officer, for the purpose of enjoining them from enforcing an order directing vaccination by a day named of all the children attending the school who had not been vaccinated within seven years. The court says that the health officer of the county is primarily the agent and executive officer of the local board of health, and is charged with the duty of enforcing such rules and regulations as the state board or the county board may adopt within the scope of the powers conferred on them by the statute. But the court is not prepared to say that without express authority from either the state board or the county board the health officer would have power to demand that each child enrolled at a public school shall bring a certificate of successful vaccination or be vaccinated by a certain date, or be denied the privilege of attending the school. By this the court does not mean to hold that before the health officer can act in any case he must be armed with express authority from one of the boards, because many matters might come up in connection with the duties of his office that he should be permitted to perform, in the exercise of a sound discretion and within the scope of his general authority, without having the express sanction of either the state or county board. Each of these boards is charged independently with preserving the public health and with taking such action as in the exercise of a reasonable discretion may be deemed necessary to suppress and prevent the spread of infectious or contagious diseases. The only substantial difference in their powers, in respect to taking such measures as may be necessary to conserve the health of the people of the state, is that the state board is invested by the statute with larger power and greater jurisdiction than the local boards. But the local boards may under the statute exercise the authority conferred on them without asking the advice or the consent of the state board. The court is further of the opinion that the language of the statute is broad enough to confer on the state board and on the local boards the authority to issue an order such as the one here in question when they believe there is reasonable apprehension of an epidemic of smallpox in a school district, and that the vaccination of the schoolchildren is the only means by which it can be prevented. The argument was made that this construction gives to these boards great power. This is true, but necessarily so. The conditions which they were created to deal with could not be successfully met, unless they had large power and discretion. In the very nature of things it would be utterly impracticable for the legislative department of the state to undertake to define the conditions that must exist before these boards could take such action as might be necessary to control situations that are constantly coming up in various forms; and so if these agencies of the state created for the purpose of conserving the health of the people are to accomplish the objects for which they were created, they must needs be given authority to take such prompt and effective action, in each case as it comes up, as in the exercise of their reasonable judgment and discretion may be deemed necessary to meet the exigencies of the occasion. They are not required to wait until an epidemic actually exists before taking action. Indeed, one of the chief purposes of their existence is to adopt and enforce such timely measures as will prevent epidemics. What they shall do and how it shall be done are matters left to their sound discretion. But of course these boards cannot adopt unreasonable or arbitrary rules or regulations or, without cause, harass the public or needlessly subject individuals to expense or inconvenience or act, unless they have reasonable grounds to believe that the action taken is necessary to prevent or suppress the disease sought to be controlled.

Liability on Note Given in Buying Out Physician

(Harshbarger vs. Eby et al. (Idaho), 156 Pac. R. 619)

The Supreme Court of Idaho affirms a judgment in favor of the plaintiff, a physician, who sued the defendants, a physician and his wife, on a promissory note for $2,500 given as the balance of the purchase price agreed to be paid by the defendant physician for the business, property and good will of the plaintiff. The court says that an instrument designated a contract of sale, which was executed by the parties, set out in full and described the real and personal property purchased and the total sum to be paid for the business, the good will, and the property enumerated, being $5,500, of which $3,000 was paid in cash. The defendants sought to introduce evidence of the value of each article of personal property and the real estate separately for the purpose of establishing that the business, personal property, real estate and good will purchased were not of the value that had been theretofore agreed on between the parties, but that the personal property and real estate were worth only $1,750, and that the business and good will were valueless, and that therefore the note in suit had been obtained without consideration. But it was not important that it should appear that there was a full consideration for the note, as the defense would fail if there was any consideration whatever for the note, no matter how small. This court has heretofore held that inadequacy of consideration is no defense to an action on a promissory note unless there was also fraud on the part of the promisee, that it is not the duty of the court to relieve parties from the obligations of their contracts fairly made because they are disadvantageous or foolish, but to enforce them, and that courts, both of law and of equity, refuse to disturb contracts on the grounds of mere inadequacy, whether the consideration is of benefit to the promisor or of injury to the promisee. It was not contended in this case that there was any fraud perpetrated on the defendants in the inception of the contract, but, on the other hand, it was contended that they did not receive the practice that the plaintiff had represented that he had enjoyed, that the good will of the business had not brought them the expected returns, and that collections were not as good as the plaintiff had claimed they were. These were not such statements as, under the facts in this case, would constitute fraud, even should it be conceded that fraud was properly alleged. The defendants had by their own showing ample opportunity to advise themselves on these matters. Moreover, it was error, under the circumstances, to permit the defendant physician to testify to the value of each article of personal property and of the real estate separately, for the reason that the value of the business, property and good will had been fixed by the parties in the contract, and it varied the express terms of a written contract which was admitted by the defendants to be the contract entered into in which the price to be paid for the business, the property and the good will was fixed.

Society Proceedings

COMING MEETINGS

American Academy of Ophthal. and Oto-Laryn., Memphis, Dec. 11-13.
American Association of Anatomists, New York, Dec. 27-29.
Clinical Congress of Surgeons, Philadelphia, Oct. 23-28.
Medical Association of the Isthmian Canal Zone, Ancon, Dec. 16.
Society of American Bacteriologists, New Haven, Conn., Dec. 26.
Southern Medical Association, Atlanta, Nov. 13-16.
South. Surg. and Gynec. Assn., White Sulphur Spgs., W. Va., Dec. 11-13.
Western Surgical Association, St. Paul, Dec. 15-16.

AMERICAN ASSOCIATION OF OBSTETRICIANS AND GYNECOLOGISTS

Twenty-Ninth Annual Meeting, held at Indianapolis, Sept. 25-27, 1916

(*Concluded from page 1252*)

Rupture of the Cesarean Scar

DR. ABRAHAM J. RONGY, New York: Spontaneous rupture of the cesarean scar occurs in about 3 per cent. of cases, usually during labor, sometimes during the latter half of pregnancy, especially in the last six weeks. Rupture will occur in cases which run an afebrile course and in which union of the wound was apparently by first intention. One third of all cases in which operation is performed for reoperated section show evidence of inflammatory reaction in and about the uterine wound. The result in such cases is a weakened scar. Proper suturing of the uterine wound and exact approximation of the edges will not always prevent subsequent rupture of the scar. The mortality rate of repeated section is smaller than that of primary cesarean section, because these patients are more carefully watched by competent men. A patient who has had cesarean section should not be allowed to go through a tedious or severe labor. If labor does not progress rapidly, repeated section should be performed. When advising a patient to have a cesarean section, the management of subsequent pregnancies should be taken into consideration and discussed with one of the members of the family. Fully 75 per cent. of women who have had a cesarean section are delivered by repeated section during their subsequent labors. Cesarean section creates a new problem for the woman, and therefore we must carefully weigh the indications before deciding on the abdominal route. The dictum "once a cesarean section always a cesarean section" holds true in fully 75 per cent. of cases.

Discussion on Uterine Rupture

DR. PALMER FINDLEY, Omaha: If ninety-seven women out of a hundred go through labor with a cesarean scar successfully without intervention, the thing to do is to put the woman in a hospital, if possible, and be ready to interfere; but we should not adopt the method of cesareanizing every woman who has had a previous cesarean scar in the uterus. We should not be guided by any 3 per cent. of changes except this: we should take every precaution to safeguard the woman in the event of imminent rupture of the scar.

DR. J. HENRY CARSTENS, Detroit: I have had about fifteen patients on whom I have performed cesarean section a second time. In all of the cases there was pelvic deformity. Not one of them was cesareanized for placenta praevia or eclampsia. I have these patients go to the hospital early, if possible, and operate on them two weeks before the expected time of labor.

DR. HENRY SCHWARZ, St. Louis: I endorse every word Dr. Findley said. Three years ago I did a cesarean section on a woman who had a temperature of 104 F. She was intensely sapremic, with a dead macerated fetus in the uterus. She was a young woman, and this was her first pregnancy. After emptying the uterus and removing a subserous fibroid which was situated on the left side of the uterus close to the external os and was blocking the pelvis, and removing a smaller fibroid near the fundus, I closed the uterus. I delivered this woman about seven months ago through the natural passages.

DR. JAMES E. DAVIS, Detroit: The problem from a pathologic standpoint is this: first, a reduction of muscle tissue, a degradation of a normal tissue, then a degradation of the connective tissue by the interposition within the connective tissue cells of syncytial cells. The connective tissue, while it may be in certain instances as strong as the muscle tissue, yet is not as resistant to the syncytiolysins. It is a tissue of very low resistance so far as its ability to withstand pressure is concerned.

DR. MAURICE I. ROSENTHAL, Fort Wayne: The important thing is infection, and that infection is predisposed by intrauterine pressure. If the lochia are kept free from the internal surface, the entire suture line closes together by the absence of the intra-uterine pressure, and that is a point in safeguarding against the infection of the wound and in securing perfect wound healing.

DR. IRVING W. POTTER, Buffalo: I have done cesarean section on a number of patients a second time without any trouble. You cannot see the scar, but if you feel from below up, you will find a thinning in many of the cases, although it is not enough to make any special difference.

Gunshot Wounds of the Abdomen in Pregnant Women

DR. LEWIS F. SMEAD, Toledo, Ohio: A woman was shot through the abdomen. The bullet perforated the colon, the uterus, the placenta, and the hand of the child. Mother recovered. In cases of gunshot wounds of the abdomen during pregnancy, the uterus at full term should be emptied by cesarean section, and at earlier periods if the organ is badly injured. A uterus during labor is liable to spread any infection which is free in the abdomen, and a pregnant uterus is therefore a menace to the patient if peritonitis develops. Hysterectomy is usually not indicated unless the uterus is badly lacerated. Drainage should always be used and irrigation very rarely.

DISCUSSION

DR. JOHN D. S. DAVIS, Birmingham, Ala.: A woman, pregnant three and a half months, was handling a small rifle when it was discharged and the bullet entered the abdomen, producing twenty-five perforations, six through the transverse colon, and nineteen through the small intestine. She was brought a distance of 85 miles. I saw her twelve hours after the reception of the injury. Instead of doing two resections of the intestine, I took out 5 feet of the intestine between the nineteen perforations. She recovered and gave birth to a living child at the ninth month.

Version, With Report of Five Hundred Cases

DR. IRVING W. POTTER, Buffalo: In these 500 cases there was not a maternal death; there were no injuries to the mother's soft parts that required repair. There were no alarming hemorrhages, and the period of involution was shorter than ordinary, with less flow during the puerperium. The convalescence was more rapid, owing to the elimination of the shock experienced by patients going through a long second stage of labor. There was also apparent greater strength of the patient at the end of the puerperium. In reference to the fetus, there were fifty-seven stillbirths, the greatest cause being prolapsed cord; in thirty cases alone death was due to this cause.

Blood Pressures During Operations

DR. CHARLES W. MOOTS, Toledo, Ohio: Having made observations and records of the pressures in 98 per cent. of our cases for the past eight years, we have come to certain conclusions: The systolic pressure alone is of very slight, if any value. The diastolic pressure alone is of much more value than the systolic alone. The pressure ratio is the essential factor and offers the earliest danger signal. There are certain elements in technic which have marked and constant effect on the pressures. These are as follows: (*a*) the psychic or emotional state of the patient; (*b*) the position of the patient on the table, the extreme Trendelenburg being the worst; (*c*) overdosing by the anesthetist; (*d*) the amount of tranmatism inflicted by the actual operation, such as cutting and tearing the tissues with scissors, the hands, and other dull instruments; the packing of large gauze packs instead of rubber tissue into the abdominal cavity, and (*e*) the preservation of the fluids in the body up to the hour

of the operation, this being absolutely necessary to maintain the usual pressures.

DISCUSSION

DR. R. R. HUGGINS, Pittsburgh: If any one cares to take the blood pressures of patients previous to operation, when he is suspicious of any weakness on the part of the circulatory apparatus of the patient, if he will take the pressure pulse with the patient in the prone position and find that it goes down, that patient is a bad risk. There will always be trouble, particularly if the inhalation form of anesthesia is used. A patient with a blood pressure of 170 or 180, with low diastolic pressure, should always be watched. The same is true of low blood pressure.

DR. J. H. CARSTENS, Detroit: I have for some time insisted on taking the blood pressure of patients a day or two before operation. If a patient has a blood pressure of 170, it is dangerous to operate before adopting some measures to reduce it.

Prolapse of the Uterus in Nulliparous Women

DR. PALMER FINDLEY, Omaha: One hundred and fifty-one cases of procidentia uteri in nulliparous women are on record. In my judgment there is an element of infantilism in most, if not all, the cases of procidentia in nulliparous women. The fact that these women are sterile is highly suggestive. Kepler collected reports of eighty cases of procidentia in nulliparous women, and of this number thirty-eight were mentally defective. In this group were dementia praecox, imbecility, idiocy, chronic mania, hysterical insanity, cretinism, and nervousness of high degree.

Radium, a Palliative

DR. DOUGLAS C. MORIARTA, Saratoga Springs, N. Y.: Radium overcomes the disagreeable odor which accompanies the breaking down of cancerous tissue. Further, it controls hemorrhage. In six cases in which I used radium pain was relieved, the odor was remarkably controlled, hemorrhage ceased, and there was a change in or a disappearance of the local pathologic tissues. Two patients died in coma two months after the treatment; four are alive and hopeful. In one case the uterine hemorrhage was not of cancerous origin, but the condition was a terminal one. I am sure the patient would have died had it not been for the use of radium. In using radium it is possible to produce a toxemia which may prove fatal, and I am sure I have seen the end hastened in this way. I would suggest two precautions when applying radium locally; first, a patient with a low leukocyte count should not be given prolonged applications; and second, it should be accompanied by the liberal administration of alkalies. No case of this type is so desperate, and no postoperative condition so hopeless, that radium should not be used with an expectation of the alleviation of the distressing symptoms.

A Modified Gilliam Operation and Its Ultimate Results

DR. ALBERT GOLDSPOHN, Chicago: An effective and lasting cure is best obtained through overcorrection, suspending the uterus at a higher plane than it normally occupies, by a substantial implantation of round ligament loops, reenforced by their peritoneal covering, into the recti muscles and their aponeurosis, best after the Gilliam technic, in addition to correction of the version. To secure the desirable degree of anteversion, and also to avoid intestinal complications, the implantation should not be more than from 3 to 4 cm. from the edge of the symphysis pubis, and it should bring the distal unused segment of the ligament and its uterine origin both in contact with the abdominal wall. The efficiency of this modification of the Gilliam operation is shown in the 127 examined cases, including the double test of pregnancy of twenty-one, nearly all natural and mature births, with a return of displacement in only 1.6 per cent.; with both pelvic and general health "good" or "excellent" in 88 per cent.; improved in 10.2 per cent., and unimproved in only 1.6 per cent. in a total number of 164 cases observed from two to seven years, or over three and one-half years on the average. Its harmlessness is shown by the utter absence of any deleterious effects at all traceable to it in the twenty-one births noted, and likewise from the absence of intestinal complications and of discomfort to the patients.

The Surgical Treatment of Uterine Cancer

DR. J. H. JACOBSON, Toledo, Ohio: The radical abdominal operation thus far has given the highest percentage of cures in operable cases. Until radium, Roentgen ray or Percy's operation shall have proved their superiority to operation, their use should be limited to the inoperable cases. There is abundant clinical evidence at hand to prove the value of radiotherapy; it therefore seems logical to follow every palliative or radical operation with radiotherapy.

The Mechanics of the Stomach After Gastro-Enterostomy

DR. J. H. JACOBSON and DR. JOHN T. MURPHY, Toledo, Ohio: All patients examined in this series were well. Gastro-enterostomy openings properly made and placed do not obliterate, and functionate equally as well in the presence of either an open or closed pylorus. To secure the maximum amount of drainage, the opening must be of ample size and placed as near the pylorus as possible, preferably in the antrum pylori. Such openings must not be made on the fundus of the stomach or on the lesser curvature. Gastro-enterostomy is essentially a drainage operation. Serious distention in the jejunum does not occur. The food is seen to pass rapidly through the many loops of the small intestine before it stops. Even in those patients who are entirely relieved of their former symptoms, food can be forced backward into the stomach from the jejunum, and although this can be done easily, such regurgitations do not seem to make any difference.

Excessive Drainage Complicating Surgery on the Common Bile Duct

DR. J. E. SADLIER, Poughkeepsie, N. Y.: Both of my cases were long-standing cases of common duct infection and incomplete obstruction. The latter was a result of the duct being filled with gallstones. In each case there was well-marked dilatation of the duct. In one case there was an alcoholic history and in the other case there was involvement of the pancreas. These two conditions can be eliminated as complete causative factors, but cannot be disregarded as partial influencing conditions in provoking the excessive drainage. I am unable to state the positive cause for this complication, but I am disposed to believe that it is due to back pressure. Is it not probable that in partial obstruction to the outflow of the bile, there occurs a dilatation of the smaller biliary radicles in the liver? Increased back pressure, which, when suddenly relieved by operative removal of the obstruction, produces a condition of venous engorgement of the liver with resulting outflow of fluid which is more in the nature of a transudation than an actual biliary secretion, and this coupled with a back flow of pancreatic fluid through the dilated duct, would account for the excessive drainage. In our operative work on the common bile duct we must consider the possibility of excessive drainage and be prepared to combat it before the patient becomes dehydrated to the danger point.

Inguinal Hernia Attached to the Cord, Undescended Testicle, Uterus, Tubes and Broad Ligament

DR. EDMUND D. CLARK, Indianapolis: My case is a very good example of hermaphroditism in a man, and it illustrates what is exceedingly rare in the hernial sac of a male. The external conformation of the patient was that of a normal male. The hernial sac contained a uterus, broad ligament and fallopian tubes. Although he has been married to an apparently normal woman for six years, no pregnancies have resulted.

Relation of So-Called Ether Pneumonia to Pelvic and Abdominal Surgery

DR. WILLIAM EDGAR DARNELL, Atlantic City, N. J.: Ether is administered in most hospitals many times every day, yet the condition known as "ether pneumonia" is a rare occurrence compared with the number of ether administrations given. If the pneumonia were the result of the ether, we ought to expect to have many cases every week. Rovsing proved experimentally that although ether does occasion

increased secretion of the salivary glands of the mouth, the larynx, the trachea and the bronchi are not irritated at all, even when the animals are killed by administering ether through a tracheotomy tube until they are dead. The only way, therefore, that ether can produce pneumonia is by the aspiration of the accumulated saliva in the throat, usually the result of technical error on the part of the anesthetist, who should not allow the secretion to accumulate in the throat. Such secretions may be infected from the buccal cavity. It is quite possible that tonsillar infections and involvement of the nasal accessory sinuses or the teeth may be one of the causes of postoperative pneumonia which has been attributed to ether. It would seem proper to conclude, therefore, that cases of pneumonia following operations are not due to the ether. The term "ether pneumonia" should be discarded and forgotten. Postoperative pneumonia occurs with great rarity, except after abdominal operations, and is then probably due to an infection already existing in the bronchi or lungs at the time of operation, or to imperfect aeration and ventilation of the lungs by reason of the fear of taking deep breaths after a laparotomy; but most often such pneumonia is a secondary infection of the lung following a septic abdominal condition.

Removal of the Appendix for the Cure of Trifacial Neuralgia and Other Nerve Pain About the Head and Face

Dr. Maurice I. Rosenthal, Fort Wayne: I do not claim that we have established a new pathology for trifacial tic and kindred affections, but I do claim that in seven cases we fixed the pathologic condition in the vermiform appendix, even though the physical and subjective evidence of appendicitis was so obscure as to be entirely overlooked. In all but one case there was present almost symptomless chronic appendicitis of the obliterating type; the odd case was a symptomless pus case. One case was on the order of migraine or so-called sick headache. It has not been uncommon in my experience to note the cure of migraine and so-called sick headache after removal of a diseased appendix. It is quite possible that many of these cases come under the same pathology as does tic douloureux and other nerve pains about the face and head.

INDIANA STATE MEDICAL ASSOCIATION

Annual Meeting, held at Fort Wayne, Sept. 27-29, 1916

(*Continued from page 1251*)

The president, Dr. George F. Keiper, LaFayette, in the Chair

Influence of Modern Immunity Research on Surgery

Dr. Murray N. Hadley, Indianapolis: The question of immunity should be viewed in the broad, biologic sense. By the biologic conception of disease we mean recognition of the fact that the defensive mechanism of the individual must be increased. The problem of surgical infections has been shifted to the field of biochemistry. We now recognize that when an individual becomes the host of pathogenic micro-organisms his entire physiochemical balance has been disturbed and under such conditions recovery is to be sought by resort to those remedies and measures which strengthen and stimulate normal body defense.

Dr. C. B. Danruther, Laporte: Immunity in its broadest sense is the effective resistance of the host against any deleterious substance; in the usual and more restricted application, the resistance of the host to infective micro-organisms and their products. A more recent theory advanced by Vaughan explains all forms of immunity by the inability of a micro-organism to grow in the body of the host because of the presence or lack of certain ferments which either destroy the organism directly or prevent it from obtaining suitable nutrition. The fundamental principles are the same, being one complex set of phenomena viewed from different angles.

DISCUSSION

Dr. V. H. Moon, Indianapolis: The specificity of immunity lies at the very foundation of a large amount of treatment of infectious disease. To establish an immunity by therapeutic means, such as the application of vaccines, we must use the causative organism of that infection as our antigen.

Dr. George Spohn, Elkhart: When an appendix is removed, and there is infection existing before the operation, would there be any advantage in using vaccines?

Dr. Leonard F. Schmauss, Alexandria: The principles Dr. Hadley emphasized ought to be encouraged, but I would caution against going to the other extreme. I would not want to discourage the use of antiseptics, especially in infected wounds, and depend on the outside application of salts to draw away the infection.

Dr. M. N. Hadley, Indianapolis: The question of vaccines in acute appendicitis involves their use in all acute infections. If you agree that the use of vaccines is indicated in an acute surgical infection, you would use them under these circumstances. It seems to me not a wise thing to do. The question of antiseptics must be governed by facts. All wounds are treated at first with antiseptics, but the problem is entirely different then to what it is forty-eight or seventy-two hours later when the organisms are scattered through the tissues. If you can use antiseptics immediately or within six hours after the wound has been made, use them.

Visceral Syphilis

Dr. George W. McCaskey, Fort Wayne: The treatment of visceral syphilis, with one or two very notable exceptions, is simply the treatment of syphilis. By a judicious combination of mercury and the iodids with salvarsan and neosalvarsan, the patient is best served.

DISCUSSION

Dr. A. W. Brayton, Indianapolis: I consider syphilis wonderfully amenable to treatment, as much so as typhoid. The only drugs which destroy the syphilitic organism are the mercurial salts and the arsenical compounds introduced by Ehrlich—all inexpensive and easily given. We must diagnose our cases carefully. Patients must be kept under observation for several years. Syphilis, like tuberculosis, may be dormant for fifty years and then break out in various forms.

Dr. Henry A. Christian, Boston: The Wassermann test has both increased and decreased our diagnostic difficulties. In cases of latent syphilis we have received great assistance, because there was nothing in the case prior to our securing a positive Wassermann that would indicate that the patient had syphilis. On the other hand, a positive Wassermann brings about the necessity of deciding whether that has anything to do with the patient's present condition. Sometimes it does, and sometimes it does not. I know of nothing that requires keener diagnostic skill than that decision. When we weigh the two sides against each other, however, I think the aid we have received outweighs the difficulties added. The Wassermann should be a routine diagnostic measure in all cases in which any difficulty exists.

Dr. Charles P. Emerson, Indianapolis: There is value in the Wassermann test, but not nearly so much as we sometimes try to obtain from it. A Wassermann which is not 100 per cent. positive, or a negative Wassermann, should be considered as though the test had not been made. On the other hand, not all patients showing a positive Wassermann are suffering from syphilis. The fact that a patient has a 100 per cent. Wassermann only opens up the possibility of syphilis, and we must not take the Wassermann test as adequate diagnosis without considering the essential physical signs. The earlier we diagnose syphilis and begin our treatment, the less damage will be done; especially is this true of the central nervous system and the arterial system.

Dr. F. W. Cregor, Indianapolis: If we look on the Wassermann test as an aid to diagnosis and not a guide to diagnosis, I think we shall place it in the proper light. Unquestionably we find more visceral syphilis in women than in men, especially about the pelvis and lower bowel, owing to the fact that women suffer more from constipation and the consequent irritation, and syphilis is prone to manifest itself at points of irritation.

Dr. Albert E. Sterne, Indianapolis: We should regard laboratory findings (in syphilis diagnosis) wholly as symp-

toms which may or may not be present, just as any other set of symptoms. The fact that a symptom is absent does not exclude a disease so long as other symptoms speak for the presence of that disease. The absence of findings in a Wassermann test does not necessarily mean that there is no syphilis; its presence means that there is syphilitic infection, but it may not be active, and other symptoms must be taken into consideration with this test. I want to emphasize the fact that the central nervous system is invaded early in the course of syphilis, and it is a very great mistake to neglect the routine serologic examination until the symptoms of lesions of the central nervous system have been definitely shown. If there is a positive Wassermann reaction of the spinal fluid, that is the time when intraspinal treatment should be given, and not several years later. It is too late to expect definite improvement when the patient shows unmistakable signs of tabes and paresis. With our old methods our results were almost as good as they are today. After several years of careful investigation we cannot say that we can register a single cure in instances of syphilis of the central nervous system by our newer methods of treatment. I believe we delay the results, but we cannot say that we find a single cure.

Necessity of Coordinating Methods in the Definitive Diagnosis of Lesions in Pulmonary Tuberculosis

DRS. F. B. WYNN and R. C. BEELER, Indianapolis: Formerly the whole burden of responsibility for diagnosis and treatment was placed on the pathologist. Now we have reached the group of serologic tests, and on them are being placed most onerous burdens. Equally interesting and instructive are the revelations coming through physical laboratory methods. The knowledge obtained through the Roentgen ray has been so marvelous oftentimes that it is not strange to find overzealous roentgenologists making unwarrantable claims for its efficiency in diagnosis, and just as often practitioners rely on this "short-cut" to diagnosis, neglecting time-honored methods and defeating broader ideals in diagnostic procedure. Among the particular diseases in which this error has been committed, pulmonary tuberculosis has been most sinned against. It is not fair that the practitioner should put on the laboratory the whole burden in the diagnosis of tuberculosis. He should exhaust every other means to determine the truth. Careful examination of sputum does offer an absolute means of diagnosis in a majority of cases, but negative reports have often led practitioners to give unwarrantable assurance that tuberculosis does not exist. A careful study of the possible sources of infection, due consideration to the mode of life and previous diseases, and careful analysis of the development of the complaint will often give a clue to diagnosis when laboratory methods fail.

Radium Therapy

DR. T. C. KENNEDY, Indianapolis: The great value of radium in cancer can be judged only by keeping constantly in mind the fact that only the hopelessly inoperable, or patients with postoperative recurrences are sent for radium therapy. If we relieve a small percentage and occasionally cure a patient who has been operated on or been refused operation on account of the seriousness of the condition, we have done much for suffering humanity.

DISCUSSION

DR. M. I. ROSENTHAL, Fort Wayne: Radium is a most valuable adjunct to surgery in the treatment of malignant growths, fibroids, and many other conditions. A woman with cancer of the uterus was operated on by the radical method, made a beautiful recovery and remained well for four years, then returned with a recurrence in the scar—a rare occurrence. We used radium, and after the ordinary treatment this carcinomatous condition has evidently disappeared. In cases such as this, radium is the only treatment; it is the last resort.

Diagnosis in Certain Gastric Disorders

DR. H. H. MILLER, South Bend: In the diagnosis of diseases of the digestive tract, early diagnosis is of prime importance. Most of the failures are due to carelessness in not getting all of the evidence and then considering it as a whole. Exploration should always be considered when the diagnosis remains in doubt after every other means has been used to come to a decision.

DISCUSSION

DR. A. B. GRAHAM, Indianapolis: The great mistake today is insufficient cooperation between internist and surgeon, especially in the treatment of gastric disorders. We criticize each other instead of getting together, working hand in hand, and trying to avoid the mistakes which we are making as individuals. The Roentgen ray is the most valuable method of diagnosis in diseases of the gastro-intestinal tract, but we must all work together—surgeon, internist and roentgenologist.

DR. MILES F. PORTER, JR., Fort Wayne: A most important point in diagnosis and one often neglected is history taking. It is done too hurriedly. It is a good plan to take a history a week or ten days after the first time. It does not sound the same. I think it would be a fairly safe rule in the majority of gastro-intestinal disorders of the subacute or chronic type to make your diagnosis, make your plans for what you intend to do, and then start all over again. You will notice a difference. It is the same patient and the same doctor, but the history is different.

DR. F. W. FOXWORTHY, Indianapolis: The surgeons of the United States Army make an effort to prevent these gastro-intestinal disturbances by correction of diet, so that they will not have to make this diagnosis, and I think the future will show that to be the proper method of treatment—prophylactic instead of curative.

(To be continued)

THE MEDICAL SOCIETY OF THE STATE OF PENNSYLVANIA

Sixty-Sixth Annual Meeting, held at Scranton, Sept. 18-21, 1916

(Continued from page 1181)

Acidosis

DR. J. HAROLD AUSTIN, Philadelphia: Acidosis is an abnormal diminution in the amount of carbonates and phosphates of the blood. In severe acidosis the deepened respiration at an increased rate constitutes the most characteristic feature of the clinical syndrome. The term "acid intoxication" may be used for the severe grades of acidosis with a clinical syndrome of which the most characteristic feature is the peculiar hyperpnea without cyanosis. In the severe acid intoxication of childhood with acetonuria, the withdrawal of fats, or perhaps of all food except glucose, the washing out of the stomach and the cleansing of the intestinal tract with castor oil and enemas are of first importance. The administration of alkali may bring about a cessation of the hyperpnea of acid intoxication, and diminish the laboratory evidence of acidosis. In the severest cases of acid intoxication, however, death occurs even when the urine has been rendered alkaline. This is probably due to the fact that although the buffer value of the blood has been restored, the altered condition in the tissue cells is less readily reached or the injury done is irreparable.

DISCUSSION

DR. ALFRED STENGEL, Philadelphia: When we are directing our therapeutics against a definitely ascertained disease, we are apt to overlook the possible presence of subsidiary conditions much more important than the original disease. In treating cardiac decompensation, under certain circumstances such a patient may be more seriously threatened by the acidosis encountered than by the cardiac decompensation. Similarly in renal disease, the patient may be more seriously threatened, if such a thing is possible, by the accompanying acidosis than by the renal disease. Occasionally, patients with acid intoxication do recover under treatment. I have seen two such instances. The general attitude of the medical profession that patients with diabetic coma cannot recover is wrong. The severe intoxication should be fought to the end; even though we may be defeated in ninety-nine cases out of a hundred.

The Failing Heart

Dr. Howard S. Anders, Philadelphia: The failing heart indicates loss of reserve force, and is almost invariably curable. Heart failure represents the end-result. The stability and expectancy of life are dependent not alone on mere ventricular power and vigor, but also on a permanence of reserve force. A fibrillatory character of ventricular function is probably one of the best danger signals of a failing heart. One of the most palpable causes of a heart that is failing functionally is that of intestinal autotoxemia. Digestive disturbances with gastric and colonic distention and acidosis are also frequent elements in failing heart.

DISCUSSION

Dr. James D. Heard, Pittsburgh: The underlying pathologic process in cardiac failure may elude the investigator even after the most careful histologic examination. Of the many tests for determining latent heart weakness, we have none that are satisfactory. The method of Barringer of estimating functional capacity of the heart through a study of the delayed rise in blood pressure appears to be worthy of further examination. The early recognition of alternation of the pulse is of great prognostic value. The longest survival of any case recorded in which this condition was found was that of a patient of Tabora who was alive six years after the arrhythmia was demonstrable. It is probable that the majority of such patients will not live more than a year after the onset of the alternation.

Typhoid and Typhophors

Dr. Samuel G. Dixon, Harrisburg: In 1906 there were in Pennsylvania 3,917 deaths from typhoid; in 1915 they numbered 1,025. In 1906 there were reported sick of typhoid 24,471; in 1915 the number was 8,048. One source of danger against which no adequate protection has been found is the carrier. For one who carries typhoid the name of typhophor is proposed as brief and distinctive. The law of 1915 makes possible the exclusion of typhoid carriers from the kitchen and other parts of hotels and restaurants. Similar legislation concerning the producer or distributor is desirable. The examination of each potential carrier would be a great gain in controlling typhoid. The protection of our watersheds from pollution and against possible carriers among construction and repair workers is a question of much importance.

DISCUSSION

Dr. Alfred Stengel, Philadelphia: The employment of kaolin in these cases on the chemical principle of absorption offers a beautiful illustration of the introduction of physical chemistry into medicine and surgery, the credit of which is due to our bacteriologists. Kaolin may also be used for spraying the throats of diphtheria carriers. Possibly the value of our use of bismuth and other inert substances in the treatment of gastro-intestinal disturbances may also rest on the principle of absorption.

Significance of Hunger Pain

Dr. J. W. Luther, Palmerton: I am inclined to agree with Einhorn, who states that Moynihan's syndrome may occur with or without ulcer, and favors the theory that hunger pain is caused by a spasm of the pylorus induced by hyperchlorhydria, which is often associated with hypersecretion and which is in a large percentage of cases complicated by a justopyloric ulcer. When "hunger pain and food relief" occur with a painful pressure point and occult or microscopic blood in the feces, the roentgenologic examination shows gastric hypermobility and a shortened duodenal cap; and possibly also when Einhorn's string test, if used, is positive a diagnosis of duodenal ulcer may be made, though many authorities claim that even then it cannot be accurate and that a diagnosis of the position of the ulcer by the lateness of the onset of pain is impossible.

DISCUSSION

Dr. William H. Howell, Altoona: Hunger pain signifies duodenal ulcer. It is not pathognomonic by any means, but helps to confirm suspicions. The Roentgen rays and a careful and thorough history of the case are essential to a diagnosis. The symptom should never be drawn from the patient, but should be volunteered by him.

Dr. J. B. McAlister, Harrisburg: As hunger pain is most commonly encountered in cases of duodenal ulcer, it is a most valuable symptom in the diagnosis of that disease. Yet pain which closely resembles it is often present when a patient is suffering from other affections. Hunger pain is not an accompaniment of any definite chemical state of the stomach. As a rule, acidity is high; but even low degrees have been found. Hunger pain may be a symptom of acid gastritis, and is also found in catarrhal gastritis; it is also present in gastrectoptosis, enteroptosis or nephroptosis. In hyperorexia, or parorexia, the sensation of hunger might become so intense as to amount to actual pain. Physicians are warned against making a diagnosis of gastric neurosis because a patient happens to be a neurasthenic. The patient may present the appearance and symptoms of a neurasthenic and yet harbor a gastric ulcer or carcinoma.

Dr. J. A. Lichty, Pittsburgh: I agree fully that the etiologic interpretation of this symptom is not clear, and I think that the interpretation Luther gives is probably the correct one. There is one point to which I do not believe I could go with Dr. Luther, and that is that it is due to a hyperchlorhydria. Pylorospasm can be caused by other conditions than hyperchlorhydria. Mr. Moynihan's expression of some ten years ago that hunger pain is duodenal ulcer can certainly not be substantiated.

Dr. Ernest Laplace, Philadelphia: I think that by common consent the pain described as hunger pain is usually a contraction of the pylorus. Surgically speaking, I have almost never failed to find some sort of a lesion around the stomach or even down as far as the rectum when there has been persistent hunger pain.

Dr. Herbert B. Gibby, Wilkes-Barre: There is no doubt that the most prominent symptom in ulcer is hunger pain, but I cannot agree that pains of this character mean only duodenal ulcer. It may mean a gastric ulcer.

Facts and Fallacies Concerning Electrotherapeutics

Dr. W. L. Clark, Philadelphia: Progress in the use of electricity in therapeutics has been retarded by the ancient teaching that electricity is purely psychic in its action, by the absence of teaching of the subject in the majority of medical schools, and by the prejudice which has arisen on account of the association of electricity with irregular practice. I would urge on superenthusiastic electrotherapeutic advocates the necessity of being guarded in their claims, and that teaching in electrotherapeutics be established in all medical schools. Electricity, though always the same force, when modified with knowledge, intelligence and skill may be made to produce different effects, and it is on this principle that the whole superstructure of electrotherapeutics rests. The effects produced by electricity may be classified as mechanical, chemical, thermic, actinic and psychic. Some of the future possibilities of electricity in therapeutics are the abstraction of metallic poisons from the body by ionization, safe local and general anesthesia with loss of consciousness and relaxation, and relief of pain and the production of sleep, thus lessening the need of opiates.

DISCUSSION

Dr. J. Torrance Rugh, Philadelphia: The trouble partially lies with the electrotherapeutists themselves. To make unguarded statements, such as I hear from some of the electrotherapeutists, is unwise.

Dr. G. G. Davis, Philadelphia: There is no reason why we should not have a chair of electrical therapeutics in our colleges in the same way that we have the other specialties.

Value and Limitation of Radiotherapy in Gynecology

Dr. Floyd E. Keene, Philadelphia: I analyzed 116 cases. Sixty-nine cases were of malignant growths of the vagina, cervix or urethra, and forty-seven cases of benign hemorrhage of myomatous or myopathic origin. The majority of cases received from 85 to 110 mg. of radium for twenty-four hours. In one case of cauliflower growth, in a woman

of 28, who was six months pregnant, 210 mg. were applied with complete cure. The only immediate effects were nausea and vomiting, which usually ceased from twenty-four to thirty-six hours after removal of the radium. In 44 per cent. of cases of cancer there was complete healing, and in only two cases was there no benefit. In not a single instance has there been a failure to check bleeding in the case of benign hemorrhage. Mild symptoms of menopause were developed in ten cases. In cancer of the fundus, operation is preferable to radium; this is also true of early cervical cancer. In cases of small myoma, when the only symptom is hemorrhage, 100 per cent. of cures may be expected. This work is still on probation.

(To be continued)

Current Medical Literature

AMERICAN

* Titles marked with an asterisk (*) are abstracted below.

American Journal of Medical Sciences, Philadelphia

October, CLII, No. 4

1 Diagnosis and General Treatment of Syphilis. J. A. Fordyce, New York.—p. 469.
2 Treatment of Syphilis of Central Nervous System. H. F. Swift, New York.—p. 490.
3 *Persistence of Active Lesions and Spirochaetes in Tissues of Clinically Inactive or "Cured" Syphilis. A. S. Warthin, Ann Arbor, Mich.—p. 508.
4 Hereditary Syphilis in Light of Recent Clinical Studies. B. S. Veeder, St. Louis.—p. 522.
5 *Case Illustrating Anatomic Seat of Mobile Spasms. C. L. Dana and B. Gere, New York.—p. 535.
6 Relation of Hypophysis to Certain Clinical Manifestations and Therapeutic Application of Its Extracts. J. L. Miller, Chicago. —p. 549.
7 Valu. of Ambard Quotient in Estimation of Renal Function. L. Jonas and J. H. Austin, Philadelphia.—p. 560.
8 *Expectorant Action of Ammonium Chlorid. W. Coleman, New York.—p. 569.
9 Study of Proximo-Ataxia and Acro-Ataxia in Tabes Dorsalis. F. B. Clarke, Milwaukee, Wis.—p. 574.
10 *Tuberculosis (Concealed): Hitherto Unrecognized Clinical Type. G. D. Head, Minneapolis.—p. 582.
11 *Acute Heart Block Occurring as First Sign of Rheumatic Fever. P. D. White, Boston.—p. 589.

3. Abstracted in THE JOURNAL, June 17, p. 2032.

5. **Anatomic Seat of Mobile Spasms.**—The case of a child who, from the age of 6 months to 6 years when he died, suffered from continual choreic and tonic spasms, involving nearly all the muscles of his body, including the neck and face, is reported by Dana and Gere. The child was normal until the fourth month; then he had an attack of stupor, etc., diagnosed as "meningitis," then development of clonic and tonic movements involving face, throat, neck, trunk, arms and legs, the legs being mainly rigid, so that the child could only imperfectly stand or walk; no paralyses, no atrophies, no anesthesias, special senses normal, intelligence retarded, but not seriously. Duration of condition five and one-half years. Death occurred following an operation to resect the posterior spinal roots. The tonic and clonic spasms with some permanent rigidity of the lower extremities were the main features of the case. The tonic spasms caused an apparent spastic paraplegia, although there was no real paralysis, nor objective evidence of involvement of the pyramidal tracts, and both the corticospinal and the peripheral motor neurons showed no or slight signs of degeneration.

The conclusions from this case are that the patient had at the fourth month a low grade infectious polioencephalitis affecting especially the motor cortex and impairing the sensori-motor mechanism, that is, the dendrites and fibrils. This led not to paralysis but to irregular motor discharges and loss of muscular control. The authors believe that the cortical changes that were found are sufficient to explain the spasmodic symptoms, and as these lesions were induced by some infection four months after birth it is a fair inference that they were primary and not secondary factors in the disease. The case presented clinically some of the features of Little's disease, with clonic and tonic spasms, but there was no real paralysis and no involvement of the pyramidal or extrapyramidal tracts, at all adequate to explain the essential features of the symptoms.

8. **Expectorant Action of Ammonium Chlorid.**—It has been denied that ammonium chlorid in the usual therapeutic doses acts as an expectorant on patients suffering from bronchitis. Therefore, Coleman decided to reinvestigate its action on the bronchial secretion in man. Patients with acute or chronic bronchitis were selected as subjects for the experiment. The sputum of patients suffering from acute or chronic bronchitis was examined for the ammonia nitrogen content, and observations were made on the subjective symptoms referable to the respiratory passages following the administration of ammonium chlorid. The sputum was collected before the administration of the ammonium chlorid was begun and at various times thereafter. The doses of ammonium chlorid varied from one-half grain every two hours to 5 grains every two hours. In one case of mild bronchitis of only several days' duration, treatment began on the second day of the attack with one-half grain doses of ammonium chlorid at two-hour intervals. Distinct loosening of the sputum and diminished roughness of the tracheal and bronchial mucous membrane followed. The taste of ammonium chlorid was evident in the sputum at first, later the sense of taste for all substances was blunted. Whenever the drug was stopped the sputum became less abundant, more tenacious, and more difficult to expel, and a sensation of dryness or tightness developed in the chest. When the drug was resumed the opposite effects were observed. The action of the drug always developed within one-half to one hour. The experiment was repeated often to eliminate doubt as to the accuracy of the observations. Therefore, Coleman is convinced that ammonium chlorid is an expectorant within the definition of the term. It probably acts by increasing the water of secretion and softening the mucus.

10. **Tuberculosis; Unrecognized Clinical Type.**—The symptoms of nervous and physical exhaustion associated with recognizable tuberculosis have been long recognized and dwelt on by all writers on this subject; but that persons showing symptoms of nervous and physical exhaustion (toxic symptoms) and exhibiting no clinical evidence of tuberculosis could still be tuberculous, and that the quiescent, silent process could serve as the etiologic factor for the symptoms of physical and nervous exhaustion of which they complain, Head says, has been overlooked.

Head cites the history of the patient whose complaint dates back over a number of years and includes a long series of symptoms of indigestion, abdominal pain, backache, insomnia, constipation, fermentative indigestion, attacks of mental depression, crying spells, dizziness, aching in the neck, headache and eyeache. Patient stated that she never had a good appetite, that the daily routine of her life exhausted her, and year after year found her building up from one attack of exhaustion only to relapse into another. She had lived a semi-invalid existence. She had tried to work at various times, but always had to give up because she became so tired and exhausted. She had had a slight nervous cough at times, but had never coughed sputum. Many consultants had examined her lungs, but had found nothing. In the last year the patient had lost 15 pounds in weight. In order to improve her digestion, she had dieted to such an extent that she could scarcely eat solid food of any kind.

A careful physical examination of the patient, including a searching examination of the lungs, revealed no evidence of organic disease. She had occasional rises in temperature to 99.2; pulse 85 to 100. No definite diagnosis could be made. Roentgen-ray examinations of the spinal column and lungs were negative. A tuberculin test was made and the reaction was positive. The clinical diagnosis of neurasthenia was abandoned and the diagnosis made of tuberculosis (concealed), focus not determined, with chronic tuberculous toxemia exhibiting symptoms of physical and nervous exhaustion. Head urges that this is a clinical type of tuberculosis

which should be recognized. It is a clinical picture of tuberculous toxemia without the focal evidence of the disease. It is tuberculosis revealed by a specific test.

11. **Heart Block as Sign of Rheumatic Fever.**—A case is recorded by White in which acute and transient heart block appeared as the first sign of an acute rheumatic fever. The conduction time between auricle and ventricle showed great delay before the onset of the joint symptoms and returned to normal about six weeks after the block was discovered. In this case the myocardium not only gave the first evidence of the importance of the illness but also showed at least temporary damage while no evidence was found of endocardial or pericardial involvement.

American Journal of Obstetrics and Diseases of Women and Children, York, Pa.

October, LXXIV, No. 4

12 *Fetal and Placental Syphilis. E. D. Plass, Baltimore.—p. 561.
13 Primary Carcinoma of Vulva; Report of Two Cases. A. Stein, New York.—p. 577.
14 *Correction of Obese and Relaxed Abdominal Wall with Especial Reference to Use of Buried Silver Chain. W. W. Babcock, Philadelphia.—p. 596.
15 Uteroscopic Findings; Preliminary Report. Collection of Uterine Scrapings. A. Heineberg, Philadelphia.—p. 612.
16 Examination of Semen with Special Reference to Its Gynecologic Aspects. W. H. Cary, Brooklyn.—p. 615.
17 *Wassermann Reaction in Gynecology. P. F. Williams and J. A. Kolmer, Philadelphia.—p. 638.
18 Chronic Focal Infection of Pelvic Organs and Its Relation to Systemic Disease. F. H. Maier, Philadelphia.—p. 652.
19 Case of Krukenberg's Tumor of Ovaries. C. Foulkrod, Philadelphia.—p. 657.
20 Impacted Tumor of Pelvis with Acute Urinary Obstruction. Pelvic Pneumococcus Abscess. G. E. Shoemaker, Philadelphia.—p. 660.
21 Relation of Convulsions to Pelvic Disease. J. L. Riggles, Washington, D. C.—p. 662.
22 Acute Lymphatic Leukemia; Report of Case. T. S. D. Grasty, Washington, D. C.—p. 669.
23 Troubles of Newborn. J. Epstein, New York.—p. 714.

12. **Fetal and Placental Syphilis.**—The syphilitic placenta, Plass says, is characterized by increased size and weight, abnormal proliferation of the stroma cells and an obliterative endarteritis and endophlebitis. For practical purposes the changes are specific and offer very strong evidence of the presence of fetal syphilis, whereas their absence does not exclude the disease.

14. **Correction of Relaxed Abdominal Wall.**—An especial advantage claimed for the silver chain by Babcock is the fact that it is adapted for any size of defect and that it may be as quickly introduced as a strand of catgut or silk. The terminal link of the chain is tied to the eye of a suitable round-pointed needle by a loop of silk or linen thread, and if the needle has a size equal to that of the chain, the chain slips through the tissues almost as readily as does catgut. As it is threaded through the tissues and not merely laid or tacked in place, it is not readily displaced, and has a fixation and support which is especially desirable.

17. **Wassermann Reaction in Gynecology.**—The Wassermann reactions of 300 gynecologic and obstetric patients were investigated by Williams and Kolmer. The percentage of positive reactions (22.6) corresponds closely with the generally accepted incidence of syphilis in adults. Of particular interest is the relatively high percentage of positive reactions observed in the following conditions: stillbirths, 75 per cent.; rectal diseases, 50 per cent.; amenorrhea, 50 per cent.; habitual abortion, 50 per cent.; pelvic inflammatory disease, 36 per cent.; sterility, 33 per cent.; abortion and miscarriage, 29 per cent.; metrorrhagia, 20 per cent.; myomas of the uterus, 16 per cent.; gonorrheal vaginitis, 10 per cent.; pregnancy, 17 per cent. The authors urge that the high degree of latent syphilis in women should make a routine Wassermann test in gynecologic and obstetric practice as advisable as any other laboratory procedure.

American Journal of Orthopedic Surgery, Boston

October, XIV, No. 10

24 Standardization of Conditions Affecting Posture. H. L. Taylor, New York.—p. 569.
25 Fixation of Sacrum; Report of Cases. E. H. Arnold, New Haven, Conn.—p. 574.
26 Operative Treatment of Residual Paralysis of Poliomyelitis at Children's Hospital, Buffalo. B. Barlow and W. W. Plummer, Buffalo.—p. 594.
27 *Shortening Long Legs and Lengthening Short Legs. New Surgical Procedure. R. T. Taylor, Baltimore.—p. 598.
28 Fatal Hemorrhage in Bone Tuberculosis. Case Report and Necropsy. R. C. Paterson, Saranac Lake, N. Y.—p. 607.

27. **Shortening Long Legs and Lengthening Short Legs.**—The operation of shortening proposed by Taylor consists in the removal of the length of bone determined on, the bone ends being mortised with the upper fragment posterior to offset muscle pull and affording closer approximation. Bone pegs or dowels are driven in from the front, passing through the entire bone. The dowels are made from a tibial graft. The second procedure, or that of lengthening the femur, is more difficult, but can be accomplished with little or no postoperative pain from muscle spasm, even when myotomy and tenotomy are not done, but, Taylor says, it is preferable to divide the adductors, ileotibial band and hamstrings freely to facilitate lengthening after the bone is shaped for mortising. This operation should be done in two sittings four or five days apart. At the first, the tendons and muscles are cut, and the dowels are made from the tibial crest and kept in sterile salt solution on ice. At the second sitting the incision is made in the thigh and the fibers of the vastus separated to the bone as in the shortening operation. With the circular electric saw a linear incision is made in the long axis of the bone on the outer side of the desired length, that is, at least 2 cm. longer than it is desired to lengthen the limb.

With a thin rounded end or guarded end handsaw, a half section is made on the anterior aspect of bone down to the upper end of the longitudinal incision. Similarly, a half section is made on the posterior aspect of the bone up to the longitudinal incision at the lower end. The sickle-shaped, grooved director and retractor acts as a safeguard in these procedures. Next a nickel-plated spatula is passed around the bone on the inner side to protect the vessels, while a small electric drill cuts the cortex at intervals through on the inner side of the bone by passing it from the outside longitudinal incision through the medullary cavity to the cortex beyond. The nickeled spatula will enable the assistant to see when the inner cortex is punctured. With a series of these holes, it is then easy, with a small, thin osteotome, to cause separation of the two halves of the mortise without any splintering or cracking of the bone in an undesired direction.

Prior to operation, from the knee down, the patient has had applied swansdown adhesive traction straps and webbing, is supplied and fixed with double perineal straps on a Bradford bed frame on the operation table. At the bottom of the Bradford bed frame is a windlass attachment for the reception of the webbing traction straps. By means of the key on the windlass the desired degree of traction is made, and with an electric drill holes are now made opposite each other for the dowels in the drawn apart lengthened bone. Two dowels are inserted and hold the bone fragments in perfect apposition, while the soft parts are sutured without drainage, and the cast is applied from the toes up to and over the costal margin as a long spica, the extension straps having been removed. Only one case of lengthening has been done by the author so far, and with no untoward symptoms, showing that the procedure is safe and possible.

American Journal of Physiology, Baltimore

October, XLI, No. 4

29 *Relation of Acid to Gastric Discharge and Duodenal Regurgitation in Dog. W. E. Morse, Chicago.—p. 439.
30 Studies on Bioluminescence. Presence of Luciferin in Luminous Bacteria. E. N. Harvey, Princeton, N. J.—p. 449.
31 Id. Production of Light by Certain Substances in Presence of Oxidases. E. N. Harvey, Princeton, N. J.—p. 454.
32 Corpuscles, Hemoglobin Content and Specific Gravity of Blood During Hibernation in Woodchuck (Marmota Monax). A. T. Rasmussen, Ithaca, N. Y.—p. 464.
33 Diastase in Saliva of Ox. C. C. Palmer, St. Paul, Minn.—p. 483.
34 *Conditions of Activity in Endocrine Glands. Effect of Thyroid Secretion on Pressor Action of Epinephrin. R. L. Levy, Boston.—p. 492.

35 Effects of Epinephrin on Distribution of Blood. Volume Changes and Venous Discharge in Limb. R. G. Hoskins, R. E. L. Gunning and E. L. Berry, Chicago.—p. 513.
36 Effect of Pituitary Extract on Frog's Esophagus. J. A. Waddell, Charlottesville, Va.—p. 529.

29. Relation of Acid to Motor Function of Stomach.—The relation of gastric acidity to motility, discharge and duodenal regurgitation was investigated by Morse. The conditions imposed in this research were first, a normal fasting animal stomach; second, fluid injections of constant temperature and quantity but of varying acidities; third, abolishment of inhibiting sympathetic reflexes by pithing the spinal cord. He found that water is discharged from the fasting stomach of anesthetized pithed dogs more rapidly than any percentage of acid. The rate of discharge is decreased with increase of acidity. Duodenal regurgitation, as evident by increase in the contents of the stomach, often occurred at 0.2 per cent. acidity and in nearly all trials occurred at or before 0.3 per cent. acidity was reached. Increase in acidity increases the frequency and amount of regurgitation from the duodenum.

34. Effect of Thyroid Secretion on Action of Epinephrin.—When the thyroid has been previously removed, says Levy, cervical sympathetic stimulation or epinephrin injection does not produce an increase in the pressor response to epinephrin. It is therefore justifiable to conclude that (*a*) stimulation of the cervical sympathetic or epinephrin injection induces secretory activity in the thyroid, and (*b*) thyroid secretion renders more excitable the sympathetic structures acted on by epinephrin in raising arterial pressure. Stimulation of the cervical sympathetic causes the thyroid to secrete promptly, since thyroidectomy immediately after stimulation is followed by a progressive augmentation in pressor response similar to that observed when the glands are left in the animal throughout the course of the experiment. Intravenous injection into thyroidectomized cats of a solution of the crystalline, iodin containing compound isolated from the thyroid by Kendall, is followed by an increase in the efficacy of epinephrin as a pressor agent. The effect is demonstrable almost immediately after injection and is of relatively shorter duration than in the stimulation experiments. This substance causes no appreciable alteration in blood pressure or pulse rate. Neither during nor after stimulation of the thyroid through its secretory nerves is there any significant change in blood pressure or pulse rate. After thyroid stimulation, even at the time when epinephrin is more effective as a pressor agent, there is no increase in the augmentation of pulse rate produced by epinephrin injection. This Levy believes indicates a selective action of thyroid secretion in sensitizing sympathetic tissues to the action of epinephrin, since the increase in vascular response is not associated with greater excitability of the augmentors of the heart. In cats whose suprarenals have been previously removed, there can be demonstrated, after thyroid stimulation, an increase in pressor response similar to that seen in unoperated animals. Though there is some evidence in the literature indicating that thyroid secretion acts as a secretory stimulant to the suprarenals, the increased effectiveness of epinephrin as a pressor agent after thyroid stimulation is not dependent on a greater amount of circulating epinephrin.

Annals of Otology, Rhinology and Laryngology, St. Louis

June, XXV, No. 2

37 Bacteriology of So-Called Coccobacillus Fetidus Ozenae (Perez) with Additional Notes on Treatment of Clinical Ozena by Means of Polyvalent Vaccines Made from Same Organism. H. Horn and E. A. Victors, San Francisco.—p. 251.
38 Experience with Suspension Laryngoscopy in Over Two Hundred Cases; Report of Case. J. C. Beck, Chicago.—p. 330.
39 Gram Stain in Making Bacteriologic Diagnosis in Otolaryngology. A. B. Bennett, Washington, D. C.—p. 375.
40 Improved Method for Draining Tympanic Cavity in Purulent Otitis Media. J. Guttman, New York.—p. 389.
41 Sarcoma of Nose; Report of Fatal Case with Metastases in Cervical Glands and in Brain. J. P. Clark, Boston.—p. 392.
42 Disseminated Myelitis as Complication of Acute Mastoid Infection. J. R. Hunt, New York.—p. 407.
43 Bronchoscopic and Esophagoscopic Postulates. C. Jackson, Pittsburgh.—p. 414.
44 Cartilage and Bone in Tonsils. W. E. Grove, Milwaukee, Wis.—p. 417.
45 Air and Rhinitis. W. J. Wurtz, Buffalo.—p. 425.
46 Intubation. U. S. Bird, Tampa, Fla.—p. 434.
47 Complications in Tonsil and Adenoid Work, with Especial Reference to Chronic Suppurative Otitis Media. H. M. Becker, Sunbury, Pa.—p. 439.
48 Importance of Vestibular Mechanism in Neurology. J. R. Hunt, New York.—p. 446.
49 Rôle of Eyes in Equilibration and Orientation. A. Knapp, New York.—p. 453.
50 Suggestion Regarding Rinne Test. R. Sonnenschein, Chicago.—p. 455.
51 Chloroform as General Anesthetic in Nasopharyngeal Surgery. W. H. Nardin, Anderson, S. C.—p. 463.
52 New Mastoid Flap. A. Dighton, Liverpool.—p. 467.
53 Paper Clip in Bronchus Seventeen Years, Removed by Superior Bronchoscopy. E. Beer, New York.—p. 469.

Archives of Internal Medicine, Chicago

October, XVIII, No. 4

54 *Renal Function in Pernicious Anemia. H. A. Christian, Boston.—p. 429.
55 *Autogenous Defibrinated Blood in Treatment of Bronchial Asthma. M. H. Kahn and H. W. Emsheimer, New York.—p. 445.
56 *Albumin and Globulin Content of Human Blood Serum in Health, Syphilis, Pneumonia and Certain Other Infections, with Bearing of Globulin on Wassermann Reaction. A. H. Rowe, Oakland, Calif.—p. 455.
57 *Blood Platelets in Hemophilia. G. R. Minot and R. I. Lee, Boston.—p. 474.
58 *Excretion of Chlorids and Water and Renal Function in Serum Disease. F. M. Rackemann, W. T. Longcope and J. P. Peters, New York.—p. 496.
59 *Influence of Age and Sex on Hemoglobin. C. S. Williamson, Chicago.—p. 505.
60 Autolysis of Nitrogenous Compounds of Blood Serum in General Paralysis and Dementia Praecox. H. D. Singer and W. B. Quantz, Hospital.—p. 529.
61 Ammonium Salts and Abderhalden Test. H. D. Singer and W. B. Quantz, Hospital.—p. 538.
62 *Case of Hematochyluria; Observations on Fat Content of Urine and Pathology of Condition. D. W. Carter, Jr., Boston.—p. 541.
63 *Metabolism Studies in Case of Angioneurotic Edema. T. G. Miller and O. H. P. Pepper, Philadelphia.—p. 551.

54. Renal Function in Pernicious Anemia.—The data given by Christian indicates that in a severe anemia renal function, as measured by dietary tests, is disturbed in much the same way as is found in patients with advanced chronic nephritis, but in only one of these patients was there any evidence in the way of symptoms or physical findings of a renal lesion of the nature of chronic nephritis. It seems more probable to Christian that this disturbance in excretion is the result of the anemia, either a nutritional or a toxic disturbance in renal cellular activity. This view is supported by the improvement in renal function with improvement in blood condition and by the absence of fixation in the case in which anemia was very slight and the excretion picture very different from the other cases. Inasmuch as in pernicious anemia the dietary renal test gives a picture similar to that in quite advanced nephritis, Christian states that caution is required in the interpretation of the results of these tests in patients supposed to have nephritis.

55. Autogenous Defibrinated Blood in Treatment of Bronchial Asthma.—Inasmuch as bronchial asthma, in the authors' opinion, is due to sensitization by a foreign protein, immunization by injection of the causal protein should be of benefit. Autogenous defibrinated blood, obtained preferably during the attacks of asthma, may serve as antigen for treatment by active immunization. Six successive patients with bronchial asthma, treated by repeated injections of autogenous defibrinated blood, have shown definite improvement as indicated by diminution in frequency and severity of attacks, gain in weight, increased ability to work and improved subjective symptoms. In each case phlebotomy was performed by venepuncture, with a sterile needle. From 20 to 30 c.c. of blood were withdrawn and received in a sterile 1-ounce flask containing a number of glass beads. The contents were agitated for from five to seven minutes to separate the fibrin. The defibrinated blood was then drawn into a 30 c.c. syringe and immediately injected subcutaneously into the loin of the patient. Ten injections at intervals of about one week were made in each case. Whenever possible blood was withdrawn during an asthmatic attack, but for obvious reasons this was not always feasible. There were no local or immediate general effects following the injections.

56. **Albumin and Globulin Content of Human Blood Serum.**—A series of normal cases examined by Rowe shows that serum albumin varies between 4.6 and 6.7 per cent., that globulin varies between 1.2 and 2.3 per cent., that total proteins vary between 6.5 and 8.2 per cent., that nonproteins vary between 1.1 and 1.3 per cent., while the percentage of globulin in the total protein varies from 16 to 32 per cent. The average value for albumin was found to be 5.6 per cent., for globulin 1.9 per cent., for total protein 7.5 per cent., for nonprotein 1.24 per cent. and for globulin 25.5 per cent. In syphilis the globulin is definitely increased, while the total protein remains about normal. In pneumonia the globulin is increased more in relation to the total protein than in syphilis, while the total protein is reduced, due, probably, in large measure to a dilution of blood serum by water retention, which occurs in fever. In many chronic septic conditions, in mild infections and typhoid, the total protein is not decreased, as it is in pneumonia. Globulin seems definitely increased in all infections, except in acute tonsillitis, typhoid, and in certain mild infections, such as chronic bronchitis. The marked dilution of serum which occurs with anasarca is shown in two cases of acute infection associated with acute nephritis, which were investigated. The evidence presented shows that the Wassermann reaction is not due to a quantitative increase in the serum globulins.

57. **Blood Platelets in Hemophilia.**—The blood platelets from two typical cases of hemophilia were studied by Minot and Lee. They present the theory that the active coagulating principle of the tissue juice is derived in part, if not wholly, from the blood platelets. As evidence on this point they present the fact that in hemophilia with a normal number of abnormally resistant platelets there is a very abnormal coagulation time, but a normal bleeding time. In purpura hemorrhagica these conditions are just the opposite. The normal number of platelets, though few in number, are sufficient to form a little thrombin and clot fibrinogen in essentially normal time. The value of an excess of platelets seems to be to furnish the active coagulating principle of the tissue juice. On one of the hemophilic patients transfusion was performed with 600 c.c. of normal blood. The coagulation time before transfusion was from sixty to 120 minutes. After transfusion it was seven minutes. A gradual lengthening of the coagulation time occurred for three days, when it was again sixty minutes. Since about three days is generally assumed to be the length of life of the blood platelet, the actual clinical findings seem to corroborate the findings in vitro. Minot and Lee conclude that in hemophilia they have an hereditary defect in the blood platelets. This defect consists of a slow availability of the platelets for the purposes of coagulation.

58. **Excretion of Chlorids and Water and Renal Function in Serum Disease.**—Ten cases of serum disease were studied by the authors. These studies show very definitely that during serum disease there is often a marked but transient retention of chlorids and of water, associated frequently with slight albuminuria and cylindruria and occasionally with impairment of the excretion of phenolsulphonephthalein. In five of the ten cases there was obvious edema with gain in weight. In the other cases there was no edema and no gain in weight. In the first group it is probable, since the plasma chlorids were below normal, that some disturbance occurred primarily in the tissues during the intoxication, which caused a retention of salt and water in this situation, and was associated with a generalized edema. There may also have been some functional impairment in the excretory action of the kidneys. In the second group, in which the plasma chlorids were high, the disturbance consisted principally in the impaired elimination of chlorids and the inability to concentrate these organic salts in the urine. In the two cases in this group edema was not observed.

59. **Influence of Age and Sex on Hemoglobin.**—The amount of hemoglobin in the blood of normal persons varies so greatly at different ages that in determining whether a given blood contains more or less hemoglobin than normal, Williamson says it is imperative to consider the age. These variations are greatest from birth to 16 years of age. Between the ages of 16 and 60 there is a marked difference between the two sexes, this difference growing less after 60 years. In view of these facts, it is evident that hemoglobinometers should be standardized in absolute terms, most conveniently in grams of hemoglobin per 100 c.c. of blood. Whether or not a given blood contains a greater or less amount of hemoglobin than the normal can be determined only by a comparison of the absolute value obtained by a hemoglobinometer thus standardized.

62. **Hematochyluria.**—In the case of chyluria reported by Carter the fat content of the urine varied markedly with the fat content of ingested food. On a fat-poor diet it averaged 0.35 per cent. and on the house diet it rose from 1 to 1.4 per cent. With diet containing a daily average of 66.39 gm. of fat the average daily output of fat in the urine was 6.45 gm. The amount of fat in the urine, however, did not increase in direct proportion to the amount of ingested fat. In some cases, Carter says, chyle escapes directly into the bladder or ureter through a fistulous opening; in other cases the chyle finds its way into the urine within the kidney. In some cases the fluid entering the bladder is true chyle, in others it is lymph.

63. **Metabolism Studies of Angioneurotic Edema.**—According to Miller and Pepper the attacks of swelling in an individual with an obscure type of angioneurotic edema are associated with a retention of nitrogen, which is greater than appears in intervening periods. The excretion of acid bodies is not altered during these attacks. A disturbance of the sodium chlorid metabolism is evidenced by a reduced elimination during the three or four days preceding the maximum swelling and by a corresponding excess of excretion afterward. The convulsions from which the patient suffers are not associated with a nitrogen balance which is significantly different from that of normal periods, and there is no coincident change in the acid, ammonia, or sodium chlorid excretion. A low chlorid intake appears to have a beneficial effect on the attacks of edema, but does not influence the convulsions.

California State Journal of Medicine, San Francisco

October, XVI, No. 10

64 Infection Psychoses and Symptom Picture of Mental Confusion. A. W. Hoisholt and W. T. Harrison, Napa.—p. 392.
65 Selected Points in Gastro-Intestinal Diagnosis. C. W. Lippman, San Francisco.—p. 399.
66 Septic Teeth. J. S. Marshall, U. S. Army.—p. 405. To be continued.
67 Rocky Mountain Spotted Fever; Its Prevalence and Distribution in Modoc and Lassen Counties, California. F. L. Kelly, Berkeley, —p. 407.
68 Consideration of Rectal and Colonic Disease in Life Insurance Examinations. A. J. Zobel, San Francisco.—p. 410.
69 Resumé of Epidemiologic Investigations of Epidemics of Poliomyelitis with Reference to Contagiousness. J. C. Geiger and F. L. Kelly, Berkeley.—p. 413.
70 Federal Supervision and Licensure of Clinical Laboratories Under Postal Regulations — Public Health Measure. F. I. Lackenbach, San Francisco.—p. 415.

Illinois Medical Journal, Chicago

October, XXX, No. 4

71 Obligation of State to Growing Child. C. J. Whalen.—p. 225.
72 Use of Clean, Raw Cow's Milk in Feeding of Infants. G. H. Campbell, Chicago.—p. 229.
73 Convalescent Hospitals — Their Economic Value. J. A. Robison, Chicago.—p. 233.
74 Public Health Legislation — Recent and Contemplated. C. St. C. Drake, Springfield.—p. 235.
75 Health Department Under Commission Form of Government. F. C. Vandervort, Bloomington.—p. 240.
76 Classification of Medical Institutions and Its Effects on Medical Education and Medical Profession of America. B. H. Brookstone, Chicago.—p. 243.
77 Epidemic of Typhoid Due to Use of Polluted Water Supply at 1915 Assembly of Old Salem Chautauqua. H. F. Ferguson, Urbana.—p. 247.
78 Importance of Bacillus Carriers in Propagation of Diphtheria. G. F. Ruediger, La Salle.—p. 255.
79 Results After Four Years Use of Artificial Pneumothorax. L. S. Peters, Albuquerque.—p. 258.
80 Poliomyelitis. C. S. Nelson, Springfield.—p. 260.
81 Case of Infantile Paralysis. C. F. Hewins, Loda.—p. 264.
82 Therapeutic Starvation in Infancy. J. Brennemann, Chicago.—p. 265.

83 Efficiency in Medical Practice. C. M. Jack, Decatur.—p. 271.
84 Experimental Reproduction of Accessory Sinus Suppuration. M. F. Arbuckle, East St. Louis.—p. 274.
85 Roentgen Ray Value in Localization of Foreign Bodies in Eyeball. H. P. Wells, Chicago.—p. 274.
86 Pneumococcal Corneal Ulcers and Their Treatment. W. H. Peck, Chicago.—p. 280.
87 Two Years' Clinical Research on Trachoma Question in Southern Illinois. E. E. Edmondson, Mt. Vernon.—p. 283.
88 Psychotherapy. H. W. Long, Elmwood.—p. 286.

Journal of Bacteriology, Baltimore

July, I, No. 4

89 Biologic Variations of Bacteria. Induced Variations in Cultural Characters of Bacillus Coli. M. R. Smirnow, New Haven, Conn. —p. 385.
90 *New Culture Medium for Tubercle Bacillus. W. W. Williams and W. Burdick, Denver.—p. 411.
91 Bacillus Abortus (Bang) as Etiologic Factor in Infectious Abortion in Swine. E. S. Good and W. V. Smith, Lexington, Ky.—p. 415.
92 Relation of Protozoa to Certain Groups of Soil Bacteria. T. L. Hills, Madison, Wis.—p. 423.
93 Study of Boas-Oppler Bacillus. P. G. Heinemann and E. E. Ecker, Chicago.—p. 435.
94 Bacteriology of Silage. J. M. Sherman, Madison, Wis.—p. 445.

90. **Culture Medium for Tubercle Bacillus.**—Preparation of the medium used by Williams and Burdick: 1. Egg-white solution; dilute egg-white with ten parts of distilled water and shake thoroughly. To clear it, pass through a thin layer of cotton and then heat to 100 C. to hasten precipitation. Filter through paper. 2. Egg-yolk solution; dilute yolks with ten parts of water and stir well. Clarify by adding normal sodium hydroxid. Complete solution of the yolk is not desirable. The emulsion should be slightly turbid. To attain the proper degree of turbidity, 1 c.c. of normal sodium hydroxid is usually added to each 100 c.c. of the emulsion. The solution is heated to 100 C. and filtered. 3. Meat infusion; 500 gm. of finely chopped lean veal are covered with 1 liter of water containing 15 per cent. of glycerin, allowed to infuse for twenty-four hours and filtered; 5 gm. of sodium chlorid are added, and the infusion heated to boiling. It is again filtered and then rendered plus 1 per cent. alkaline. Place 300 c.c. of the 10 per cent. egg-white solution in a liter flask; 300 c.c. of the 10 per cent. egg-yolk solution in another flask; and 400 c.c. of the meat infusion, to which is added 15 gm. of powdered agar-agar, in a third flask. Sterilize in autoclave at 15 pounds pressure for fifteen minutes. While hot, 1 c.c. of a 1 per cent. alcoholic solution of gentian violet is added to the broth agar. The contents of this flask are now poured into that containing the egg-white and then the egg-yolk is added. The whole is poured back and forth from this flask to another so as to insure thorough mixing and then it is tubed and slanted. The tubes are left in their slanted position for about seventy-two hours at room temperature until the contents are well set. The cotton plugs are then trimmed and flamed and the tubes sealed with corks. This medium presents the same smooth inoculating surface as ordinary agar slants, contains as much moisture, is quickly made and is rendered absolutely sterile.

Journal of Immunology, Baltimore

August, I, No. 4

95 Studies on Antibacterial Serums. Standardization of Antimeningitis Serum. A. P. Hitchens and G. H. Robinson, Glenolden, Pa. —p. 345.
96 Id. Stable Bacterial Antigen with Special Reference to Meningococci. A. P. Hitchens and G. Hansen, Glenolden, Pa.—p. 355.
97 Elective Localization of Streptococcus from Case of Pulpitis, Dental Neuritis and Myositis. E. C. Rosenow, Rochester, Minn.—p. 363.
98 Phagocytosis of Erythrocytes During Stage of Hyperleukocytosis Following Injection of Typhoid Bacilli. T. G. Miller and O. H. P. Pepper. Philadelphia.—p. 383.
99 *Convalescent Typhoid Serum in Treatment of Typhoid. A. L. Garbat, New York.—p. 387.
100 Complement Fixation Test After Prophylactic Typhoid Immunization and Comparison with Agglutination Test. A. L. Garbat, New York.—p. 391.
101 Evidence as to Independence of Hemolysins and Precipitins. R. C. Johnson, Chicago.—p. 397.
102 Endothelial Opsonins. W. H. Manwaring and H. C. Coe, San Francisco.—p. 401.
103 *Relation of Typhoidin Skin Reaction to Immunity in Typhoid. Anaphylactic Skin Reactions in Relation to Immunity. J. A. Kolmer and J. H. Berge, Jr., Philadelphia.—p. 409.
104 *Relation of Luetin Skin Reaction to Immunity in Syphilis (Including Treponemicidal Action of Human Serum in Syphilis). J. A. Kolmer and S. Broadwell, Jr., Philadelphia.—p. 429.
105 *Relation of Diphtherin Skin Reaction to Immunity in Diphtheria. J. A. Kolmer, Philadelphia.—p. 443.
106 Antigenic Properties of Tubercle Wax. B. Lucke, Philadelphia. —p. 457.

99. **Convalescent Typhoid Serum.**—The serum from convalescent typhoid patients has been employed by Garbat with distinct benefit in three very severe acute typhoid cases.

103. **Typhoidin Skin Reaction.**—While the bactericidal power of human serums over *Bacillus typhosus* is increased in a proportion of persons following typhoid or active immunization with a vaccine, Kolmer and Berge claim that there is no direct relation between the typhoidin skin reaction and the results of bactericidal tests in vitro. Agglutinins or complement fixing antibodies or both are present in the blood serum of the majority of persons reacting positively in the skin test and particularly among those actively immunized, but there is no definite relation between these as either may be in evidence in the absence of the other. Powdered typhoidin and its control produce severe reactions when injected intracutaneously in doses of 0.0005 to 0.001 mg.; these reactions, and particularly that produced by the control, render the reading and interpretation of the test quite difficult and subject to much error. Cutaneous anaphylaxis to typhoidin was found apparently to persist for a longer time among those who have had typhoid than among those actively immunized with the vaccine. Among the latter the highest percentage of reactions was found during the first year following immunization. While the typhoidin reaction indicates sensitization to typhoid protein, there is not yet sufficient evidence to warrant its acceptance as an index of immunity in typhoid.

104. **Luetin Skin Reaction.**—The anaphylactic luetin test according to Kolmer and Broadwell cannot be regarded as an index of resistance to treponema pallidum; these experiments and the failure of others to produce active immunity in animals to syphilis indicate that a lytic type of immunity is absent in syphilis or, at least, that it plays but a minor rôle in this infection.

105. **Diphtherin Skin Reaction.**—The results of this study indicate that hypersensitiveness to diphtheria protein cannot be taken as an index to immunity to diphtheria and that the anaphylactic state bears no constant nor direct relation to the presence or absence of such antibodies as may be detected by experiments in vitro.

Military Surgeon, Washington, D. C.

October, XXXIX, No. 4

107 Naval Aviation Personnel. G. P. Cottle, U. S. Navy.—p. 353.
108 Experiences with Combined Vaccines in Present War, with Special References to Tetravaccine Typhoid, Paratyphoid A and B, and Cholera. R. W. Mendelson.—p. 361.
109 Etiology and Prevention of Beriberi. E. B. Vedder, U. S. Army. —p. 368.
110 Use of Habit Forming Drugs by Enlisted Men. E. King, U. S. Army.—p. 380.
111 Penetrating Gunshot Wounds of Chest. W. T. Fitzsimons.—p. 385.
112 Hospital Train De Luxe. P. L. Jones, U. S. Army.—p. 389.
113 Proposed Motor Ambulance Company. M. Ashford, U. S. Army. —p. 392.
114 Duties of Medical Supply Officers and Their Methods. H. I. Raymond and E. P. Wolfe, U. S. Army.—p. 398.

New Jersey Medical Society Journal, Orange

October, XIII, No. 10

115 *Classification and Treatment of Nephritides. M. H. Fischer, Cincinnati.—p. 555.
116 Dawn of Better Day for the Tuberculous. R. C. Newton, Montclair.—p. 580.

115. Abstracted in THE JOURNAL, July 29, p. 391.

Ophthalmic Record, Chicago

October, XXV, No. 10

117 Glaucoma Simplex and "Mule Shoe" Drain. A. E. Prince, Springfield.—p. 487.
118 Certain Eye and Ear Affections in Association with Head Injuries. H. C. Naffziger, San Francisco.—p. 502.
119 Postoperative Hemorrhage in Hemophiliac Following Enucleation of Eyeball. F. W. Alter, Toledo.—p. 512.

120 Parinaud's Conjunctivitis; Report of Case. E. S. Connell, Kansas City, Mo.—p. 516.
121 New Anterior Capsule Forceps. D. T. Vail, Cincinnati.—p. 520.
122 Rectal (Oil-Ether) Anesthesia in Ophthalmic Operations. T. L. Dagg, Chicago.—p. 522.
123 Case of Congenital Coloboma of Temporal Edge of Lens and Perinuclear Cataract. L. M. Francis, Buffalo.—p. 526.
124 Simple and Rapid Operation for Removal of Lacrymal Sac. F. H. Verhoeff, Boston.—p. 528.

Southern Medical Journal, Birmingham, Ala.

October, IX, No. 10

125 Roentgen Ray Treatment of Exophthalmic Goiter. C. A. Simpson, Washington, D. C.—p. 857.
126 *Scurvy vs. Rheumatism. D. P. West, New Orleans.—p. 861.
127 *Autogenous Bacterial Vaccines in Treatment of Bronchitis. J. E. Robinson and D. W. Queen, Temple, Texas.—p. 864.
128 Border-Line Problems in Digestive Pathology Involving Both Medical and Surgical Treatment. T. R. Brown, Baltimore.—p. 867.
129 *Syphilis in Its Relation to Public Health. L. Thompson, Hot Springs, Ark.—p. 879.
130 Some Public Health Aspects of Cancer Problem. C. E. Lakeman, New York.—p. 883.
131 Symptoms and Surgical Treatment of Certain Conditions Produced by Presence of Adventitious Bands and Membranes Within Abdominal Cavity; Report of Ten Cases. R. B. Williams, Washington, D. C.—p. 895.
132 Significance of Ammonia Coefficient in Obstetric Work. J. R. Garber, Birmingham.—p. 900.
133 Local Anesthesia in Abdominal Surgery. L. W. Grove, Tuscaloosa.—p. 905.
134 Case of Intestinal Stasis and Its Treatment. J. T. Nix, Jr., New Orleans.—p. 908.
135 Relation of Prostate and Seminal Vesicles to Arthritis; Report of Cases. C. W. Shropshire and C. Watterston, Birmingham.—p. 911.
136 Nervomuscular Mechanism of Eyes. G. C. Savage, Nashville, Tenn.—p. 915.
137 Foreign Bodies in Esophagus and Air Passages; Report of Cases. J. L. Burgess, Waco, Texas.—p. 924.
138 Endoscopy in Ambulatory Clinic. A. I. Weil, New Orleans.—p. 928.
139 Dominant Mendelian Inheritance, Principal Factor in Occurrence of Cataract and Ectopia Lentis; Report of Cases. L. H. Buxton, Oklahoma City.—p. 933.

126. Abstracted in THE JOURNAL, Dec. 11, 1915, p. 2119.

127. **Autogenous Bacterial Vaccines in Treatment of Bronchitis.**—The authors' experience is based on the preparation of 300 autogenous vaccines for pulmonary infections. Of these, practically all were administered in part or entirely by other physicians under direction. Of these, Robinson and Queen have complete reports on thirty. Twenty-two were reported cured after one year. Eight were not benefited or suffered relapse. Of the forty cases with partial report, thirty-six reported an improved condition and four reported no change.

129. Abstracted in THE JOURNAL, Dec. 11, 1915, p. 2118.

United States Naval Medical Bulletin, Washington, D. C.

October, X, No. 4

140 Studies of Industrial Accidents Which Occurred in Navy Yard at Washington, D. C. W. A. Bloedorn, U. S. Navy.—p. 585.
141 Intoxication by Detonation and Explosion Gases Aboard Ship. K. Ohnesorg, U. S. Navy.—p. 625.
142 Flat-Foot and Its Measurements. M. Clements, U. S. Navy.—p. 634.
143 Prevention of Malaria in Field. F. X. Koltes, U. S. Navy.—p. 640.
144 Wassermann Survey on Five Hundred Apprentice Seamen. C. B. Munger, U. S. Navy.—p. 642.
145 Malingering in Mental Disease. R. Sheehan, U. S. Navy.—p. 646.
146 Reorganization of Hospital Corps. W. E. Eaton, U. S. Navy.—p. 654.
147 Relation of Septic Mouth to Arthritis. F. L. Morey, U. S. Navy. p. 658.
148 Climatic Bubo. C. E. Treibly, U. S. Navy.—p. 661.
149 Dental Fountain for Crew's Use. W. M. Kerr, U. S. Navy.—p. 666.
150 Case of Gangosa. L. W. Johnson and C. W. Depping, U. S. Navy.—p. 667.
151 Chronic Lymphatic Leukemia with Acute Exacerbation and Fatal Termination. C. H. Weaver, U. S. Navy.—p. 668.
152 Acute Intestinal Obstruction Due to Volvulus. C. I. Wood, U. S. Navy.—p. 673.
153 Splenitis; Report of Case. T. Wilson, U. S. Navy.—p. 674.
154 Some Unusual Cases of Syphilis. M. B. Hiden, U. S. Navy.—p. 676.
155 Gunshot Wound of Kidney; Report of Case. C. W. Depping, U. S. Navy.—p. 679.
156 Vesical Calculus; Report of Case. T. W. Reed, U. S. Navy.—p. 680.
157 Case of Gasoline Poisoning. O. C. Foote, U. S. Navy.—p. 681.

FOREIGN

Titles marked with an asterisk (*) are abstracted below. Single case reports and trials of new drugs are usually omitted.

British Medical Journal, London

September 30, II, No. 2909

1 *Radical Abdominal Operation for Carcinoma of Cervix Uteri. C. Berkeley and V. Bonney.—p. 445.
2 Use of Insecticides (Cysticine) Against Lice. A. Bacot.—p. 447.
3 Fatal Case of Gastro-Enteritis Due to Bacillus Aertrycke vel Suipestifer. E. J. McWeeney.—p. 451.
4 Perchlorid of Mercury Poisoning by Absorption from Vagina. A. F. W. Millar.—p. 453.
5 *Case of Puerperal Septicemia Treated by Autogenous Vaccine, with Recovery. W. Grier.—p. 454.
6 New Solid Medium for Isolation of Cholera Vibrio. H. G. Gibson. —p. 454.
7 Value of Hexamine in Aural Suppuration and in Meningitis. D. Guthrie.—p. 455.

1. **Operation for Carcinoma of Cervix Uteri.**—Between April, 1907, and September, 1911, Berkeley and Bonney operated on 100 cases of carcinoma of the cervix uteri by the radical abdominal method. The operation consists in the removal of the uterus with its cervix contained in a bag formed of the upper half or two thirds of the vagina, closed by a clamp designed for the purpose. Together with the uterus and upper portion of the vagina are removed the ovaries, Fallopian tubes, and broad ligaments, the parametric and paravaginal tissue down to the upper surface of the levator ani, and the glands and cellular tissue occupying the obturator fossae and investing the external and internal iliac arteries and veins. To effect this wide clearance the ureters are entirely isolated throughout the anterior two thirds of their pelvic course. In certain cases part of one ureter has been deliberately resected, and the upper end implanted in the bladder. Similarly on occasion a portion of the bladder has been excised in cases in which separation of that viscus from the cervix was impossible by reason of advanced growth. In cases in which the glands about the external iliac artery and vein are obviously carcinomatous Berkeley and Bonney extend the dissection up to the bifurcation of the aorta.

Twenty died of the operation; 32 died of recurrent growth; 2 died of other diseases; 7 were lost sight of and 39 cured. In every case the regional glands removed at the operation were microscopically examined, and in 35 were found to be malignant. These 35 cases show a much higher operative mortality and a much greater percentage of recurrences than do the 65 cases in which the regional glands were not malignant, but nevertheless a certain proportion of them are cured. Nine died of the operation, glands were carcinomatous, 11 glands not carcinomatous; 16 died of recurrent growth, glands carcinomatous, 16 glands not carcinomatous; 1 died of other disease, glands carcinomatous, 1 gland not carcinomatous; 2 were lost sight of, glands carcinomatous, 5 glands not carcinomatous; 7 cured, glands carcinomatous and 32 glands not carcinomatous. The total carcinomatous glands were 35 and the total glands not carcinomatous were 65. Death from recurrence occurred in 32 cases, as follows: 4 cases under a year; 11 between 1 and 1½ years; 5 between 1½ and 2 years; 5 between 2 and 2½ years; 1 between 3 and 3½ years; 5 between 3½ and 4 years, and 1 between 4 and 4½ years. Two patients died of disease other than carcinoma. The first had pulmonary tuberculosis at the time she was operated on, which proved fatal a year afterward. The second died of acute urinary sepsis following an operation to close a vesical fistula a year after the radical extirpation of which it was the sequel. Neither of these patients had any sign of recurrent growth.

5. **Puerperal Septicemia Treated with Autogenous Vaccine.**—The vaccine was prepared from the patient's own blood, the culture being a pure growth of a short chained diplostreptococcus. Of this 25 million organisms were injected on the sixteenth day of her illness, and on the eighteenth day 50 million. Every third day thereafter she was given 50 million until near the end of her illness, when she had 75 million.

Journal of Tropical Medicine and Hygiene, London

September 15, XIX, No. 18

8 Equine and Bovine Streptococci as Causal Agents of Human Infections. A. J. Chalmers and A. Marshall.—p. 213. To be continued.

Lancet, London

September 30, II, No. 4857

9 *Natural History of Septic Wounds. K. Goadby.—p. 585.
10 After-Care of Persons Suffering from Pulmonary Tuberculosis. P. C. Varrier-Jones.—p. 596.
11 Clinical and Radiologic Diagnosis of Intrathoracic Tuberculosis in Children of School Age. W. Overend and C. Riviere.—p. 598.
12 Enucleation of Tonsils. W. G. Howarth.—p. 600.
13 Treatment of Cloth by Antiseptic Substances (Pyxol) in Relation to Wound Infections. M. Davies.—p. 603.

9. **Natural History of Septic Wounds.**—As a result of his investigations Goadby suggests the following routine treatment of septic wounds. Polyvalent vaccines should be prepared from strains of organisms isolated from the infected wounds, consisting of (1) streptococci (aerobic and anaerobic varieties), sensitized with antistreptococcal serum; (2) *B. proteus;* (3) *B. lactis-aerogenes,* and (4) *B. coli.* A mixed vaccine of sensitized polyvalent streptococcus 5,000,000, with *B. proteus* 10,000,000 should be given to all septic cases when admitted, pending the bacteriologic report. In cases of gas gangrene streptococcal vaccine combined with *B. proteus* and *B. lactis-aerogenes* should be used in strengths of 10,000,000 each. The inoculations as indicated by the bacteriologic examination should be repeated on the third day, and the dose raised to 10,000,000 streptococcus with 20,000,000 of the appropriate bacilli. Meanwhile, autogenous vaccine may, if necessary, be prepared for special cases when desirable; otherwise the appropriate polyvalent vaccine may be continued as determined by the bacteriologic indications. Goadby emphasizes the fact that methods which are employed to increase physiologic activity must be in logical accord, and that all proper physiologic conditions demanded by the nature of the process must be maintained. To omit such elementary principles implies a complete ignorance of the therapeutic use and action of bacterial antigens.

Medical Journal of Australia, Sydney

September 2, II, No. 10

14 Notes from No. 2 Casualty Clearing Station. H. S. Stacy.—p. 175.
15 Transmission of Australian Dengue by Mosquito Stegomyia Fasciata. J. B. Cleland, B. Bradley and W. McDonald.—p. 179. To be continued.

September 9, No. 11

16 Fibrosis Uteri. A. N. McArthur.—p. 199.
17 Transmission of Australian Dengue by Mosquito Stegomyia Fasciata. J. B. Cleland, B. Bradley and W. McDonald.—p. 200.
18 Case of Carcinoma of Male Breast. H. Rischbieth.—p. 205.

Sei-I-Kwai Medical Journal, Tokyo

September, XXXV, No. 9

19 Diabetes Mellitus Among Japanese. S. Iwai.—p. 49. To be continued.

Bulletin de l'Académie de Médecine, Paris

September 12, LXXVI, No. 36, pp. 183-201

20 Deafness from Explosion in Vicinity. (Les surdités par obusite.) I. Ranjard.—p. 195.
21 Slow Interrupters of Advantage in Radioscopy. (Il y a interêt à se servir des interrupteurs lents en radioscopie.) A. Zimmern.—p. 198.
22 Historical Sketch of Malaria in France and Need to Enforce Measures Against Mosquitoes. (Sur la nécessité de donner aux autorités sanitaires, en France, le droit de rechercher et de détruire les larves de moustiques.) R. Wurtz and others—p. 189.

Lyon Chirurgical

July-August, XIII, No. 4, pp. 537-684

23 *Extraction of Projectiles. (De l'extraction primitive des projectiles de guerre.) L. Sencert and J. Le Grand.—p. 537; (Extractions de corps étrangers au compas de Hirtz dans une ambulance fixe de première ligne.) B. Desplas and D. Chevalier.—p. 565; (Localisation orthoradioscopique des projectiles.) J. Coste.—p. 572; (De l'extraction de quelques projectiles: cerveau, etc.) Goullioud.—p. 583; (Traitement des corps étrangers du poumon.) L. Desgouttes and E. Perrin.—p. 590; (Extraction d'une balle mobile dans la plèvre gauche après établissement d'un pneumothorax artificiel.) Goullioud and Arcelin.—p. 612; (Note sur une extraction tardive de projectile dans la région du genou.) J. Rhenter.—p. 645.
24 *Arthrotomy for Shell Wounds of the Knee. (Indications et valeur de l'arthrotomie dans les plaies du genou par éclat d'obus.) L. Tavernier.—p. 616.
25 *Early Treatment of Wounds of the Knee Without Shattering of Bone. (Traitement précoce des plaies du genou, à l'exception des éclatements osseux.) J. Bosquette.—p. 633.
26 Biologic Research on War Wounds. (Les phénomènes de protéolyse dans les plaies de guerre.) A. Policard.—p. 647.
27 *Research on Early Secondary Suture of Wounds. B. Desplas.—p. 660.
28 Tardy Tetanus. Jullien.—p. 666.
29 *Operative Sterilization, without Antiseptics, of Recently Clinically Infected Wounds. R. Leriche.—p. 676.

23. **Immediate Extraction of Projectiles.**—Sencert and Le Grand have become convinced from twenty months of experience in an ambulance at the front that projectiles should be removed without delay in the well equipped ambulances at the front. The extraction of the projectiles is the complement of the mechanical clearing out of the wound. It is often indispensable and is always useful. The only exceptions are very small projectiles buried deep in muscle or bone tissue and not causing any trouble; also projectiles in the brain that cannot be reached from the wound, and likewise—at least for the moment—intrapulmonary projectiles. All others should be removed at once; they can be extracted then under local anesthesia, as a rule, while general anesthesia is required at a later date. They operate with the aid of a roentgenologist, but insist on seeing for themselves the screen picture unless the foreign body is reached at once from the roentgenologist's directions. If not, the electric light is turned off and the Roentgen rays turned on for the surgeon to see for himself the foreign body. They say that to trust to the directions of another is like a blind man's carrying a paralytic—the combination is not as efficient as one normal man. By thus alternating electric light and the Roentgen light they were successful in locating and removing at the first inspection of the wound all the projectiles in 257 cases of grave wounds.

23. **Improved Technic for Localization of Projectiles in the Tissues.**—Coste extols the advantages of records obtained by Roentgen orthodiascopy from below and also from the side, recording on a sheet of paper the findings with both, centering the shadow cast by the projectile. He describes a number of technical points with illustrations and expatiates on the special advantages of this method.

23. **Removal of Projectiles in the Lungs.**—Desgouttes and Perrin have been surprised at the facility of operative extraction of a projectile in lung tissue causing pain and dyspnea. They proceed by preliminary fixation of the lung, when it is free, if not, by systematically inducing pneumothorax, their experience having confirmed the harmlessness of pneumothorax when it develops slowly. Fifteen typical cases are described in detail, with radiographs of some.

24-25. **Shell Wounds of Knee.**—Tavernier says that the abstentionist theories of the early months had more disastrous effects on shell wounds of the knee than in any other class of wounds. Better counsels have prevailed since, and he describes a series of eleven cases in which the knee healed aseptically in eight cases. The knee is firm and in good position, the only limitation being more or less inability to bend the knee. Only one patient was left with nearly complete ankylosis; this was one of the two cases with severe infection. The technic followed and the details of the cases are described in full.

Bosquette declares that when the bone has not been shattered or the epiphysis extensively fissured, early suitable intervention wards off purulent arthritis with its sequels. Lesions of the culdesac below the triceps may heal after mere arthrotomy of this culdesac. Lesions of the interlinear region require arthrotomy in the shape of a capital H. This alone permits the adequate toilet of the interlinear region. Wounds involving merely the edges of the culdesacs, with or without injury of the bone, require simple gauze wick drainage of the breach in the joint, and secondary arthrotomy only in case of necessity.

27. **Secondary Suture of Wounds.**—The nine cases of severe wounds here described show that whenever a wound is mechanically thoroughly cleared out, it can be sutured with

confidence. It seems to be immaterial for this what method of treatment has been applied. The mechanical clearing out is the main thing.

29. **Operative Sterilization of Wounds.**—Leriche asserts that it is almost invariably possible to arrest suppuration of less than a month's duration by surgical removal of everything pathologic or of lessened vitality, leaving only healthy tissues. Some removable local cause can always be found for the suppuration. Blue pus disappears under the influence of fifteen minutes of heliotherapy or a little longer application of superheated air.

Therapeutische Monatshefte, Berlin

September, XXX, No. 9, pp. 409-464

30 *Modern Methods of Treating Syphilis; Technic of Different Clinicians. (Die moderne Salvarsan-Syphilistherapie der Autoren.) O. Naegeli.—p. 409. To be continued.

31 *Amaurosis Following Administration of Optochin; Three Cases. (Drei Fälle von Optochinamaurose.) A. Adler.—p. 420.

32 Advantages of Desiccated Potato in the Diet of the Sick. (Ueber die Verwendung der Trockenkartoffel zur menschlichen Nahrung.) Hochhaus.—p. 424.

33 *Case of Chronic Trional Poisoning. (Fall von chronischer Trionalvergiftung.) C. von Noorden.—p. 426.

34 Experiences with Substitute for Cod Liver Oil. Riehn.—p. 429.

35 Yeast in Infant Feeding. (Zur praktischen Verwendbarkeit der Hefe im frühesten Kindesalter.) Riehn.—p. 429.

36 *Significance and Treatment of Infants' Vomiting. (Beiträge zur Bedeutung und Behandlung des Erbrechens im frühen Kindesalter.) H. Nothmann.—p. 435.

30. **Modern Treatment of Syphilis.**—This long article by Naegeli analyzes the literature on the treatment of syphilis with salvarsan, bringing it down to 1913 in this instalment, comparing the technic and results of the different writers. Naegeli has been the assistant of Professor Jadassohn at Bern, and states that Jadassohn's method of treating children with inherited syphilis has proved very satisfactory. This is the intravenous injection of 0.005 gm. salvarsan per kilogram of body weight once a week. He has lately been using neosalvarsan in a concentrated solution; this permits a larger dose for older children than is possible with salvarsan. The drugs can be injected into a muscle, computing the dose from the body weight and proportional to the adult dose. He has had good experiences with wrapping infants in mercurialized gauze. They are given mercuric chlorid at the same time and the older children get calomel injected into a muscle. All the dosage is regulated by the Wassermann reaction. Baginski thinks that intravenous treatment is too dangerous in children. He had good results from intramuscular injections in 115 cases. He ascribes the same importance to the Wassermann reaction in children as in adults, no more and no less. Attempts to give the salvarsan to infants in the milk of the mother or of goats were soon abandoned, mainly on account of the uncertainty of the dosage. The same fate befell Meirowski's method of treating with serum from horses treated with salvarsan. A vein in the head or neck was occasionally utilized for the intravenous injection in some infants.

31. **Optochin Amaurosis.**—Adler warns that even the therapeutic dose of optochin is liable to seriously impair vision. In the first of the three cases he reports the amaurosis lasted for twelve hours but then subsided, leaving permanent severe changes in the retina. In the second case the impairment of vision kept up for several months and vision is not completely normal even nearly a year later. The drug was suspended at the first signs of trouble but the condition grew worse to complete amaurosis the following day. These patients were young women. In the third case the patient was a child under 2 and the amaurosis was complete and persisted for a week after suspension of the optochin. In the seven cases on record in which the ophthalmoscopic findings are reported, the findings were closely similar to those in Adler's three cases. They suggest that the amaurosis is a quinin amaurosis. With the latter drug, however, it develops only when large doses are given, while relatively small doses of the optochin have sufficed to bring it on, in one case only two 0.25 gm. doses. The visual disturbances occur in a far larger proportion of the patients using optochin than with quinin. In conclusion he states that he will not feel justified henceforth in using or in recommending optochin until further study of the subject. It may be possible to obtain equally good results with smaller doses or to eliminate from the drug the special constituent which acts on the apparatus of vision.

33. **Chronic Trional Poisoning.**—Von Noorden's patient was a woman of 68 who for twenty years had been taking from 0.75 to 1 gm. trional about twenty times a month, on retiring. An alarming syndrome developed finally, the main features of which were weak heart action, anemia and polyneuritis, following a month of general malaise and weakness. The absence of skin disturbances may have been due to the fact that the patient kept quietly indoors and that heavy curtains prevented the ingress of light—the presence of hematoporphyrin in the blood is a powerful sensitizer to injury from sunlight. In cases of this kind there are usually associated methemoglobinuria and nephritis which this indoors-keeping elderly woman escaped, although the urine was cherry red for a time.

36. **Vomiting in Young Children.**—Nothmann is inclined to explain the vomiting with which any and every infectious disease begins in many children as a manifestation of an actual stomach disturbance—the first local phenomenon from the invading infection. The vomit may contain particles of food which under normal conditions would long since have been digested and passed along. Or the vomit may contain mucus. In certain cases the vomiting seems to be the effect on the vomiting center of the fever or of infectious products. In some infants he has found swollen mesenteric glands responsible for local tenderness and vomiting. The abdomen otherwise seems normal, and the glands generally subside to normal size in a day or two. The lymphoid organs in the abdomen may swell, the same as the lymphoid organs in the throat, with oncoming or installed infection, especially in children with the exudative diathesis.

He warns further that a cough, even a mild cough, may start a susceptible child to vomiting, and thus mislead the physician to assume stomach trouble when the main cause is in the respiratory passages. Here the tendency to vomit can be arrested by reducing the irritation in the throat eliciting the vomiting reflex; a little of some anesthetic will accomplish this. Some children vomit as the sole symptom of an infectious process in the nasopharynx. It would escape attention if it were not for the child's being brought to the physician on account of the vomiting. Children in this group are generally of a neuropathic tendency, inclined to urticaria and other vasomotor disturbances, with the facialis phenomenon. Every new "cold" starts the vomiting anew. Treatment is simple and effectual. The food should be given cooler than usual, solid food should be finely chopped and the diet should be more of a fluid form. In severe cases the throat will have to be anesthetized with codein or the like, even although the throat may not be inflamed. In the hypersensitive neuropathic condition of these children the mere passage of food through the throat elicits the vomiting reflex. Nothmann has witnessed cases of so-called nervous vomiting develop in connection with vomiting from this cause—a pathologic conditional vomiting reflex thus having been evolved. It is sometimes finely differentiated. Some children vomit only at the meal and at the same food as at the time of the primary vomiting. Children who vomit only after one certain meal or one special dish usually belong in this category, and treatment should be by suppressing for a time the cause which brings on the conditional reflex. In many cases one or two weeks of complete change of the taste and composition of the meal in question will break up the tendency to vomit.

Vomiting may also appear as a symptom of disease in the nasopharynx not accompanied by cough. The vomit contains masses of secretions from the diseased nose or throat, the children vomiting when the secretions swallowed reach a certain bulk. By feeding chilled food in spoonfuls the tendency to vomit may be held in check and the children not be further debilitated by loss of their nourishment. If nothing else helps, lavage of the stomach will ward off vomiting for hours and days thereafter. This permits the children to

retain their needed food. He rinses out the infant's stomach with warm Carlsbad or Ems water and waits for fifteen minutes before giving the food. He adds that lavage of the infant stomach is so simple when done by a practiced hand and the benefit therefrom is so great in these cases that he commends it warmly, to be repeated at need.

Gazzetta degli Ospedali e delle Cliniche, Milan

September 10, XXXVII, No. 73, pp. 1137-1152

37 *Lavage and Local Medication of Spinal Canal in Traumatic Meningitis. (Il lavaggio e l'antisepsi del canale rachideo in un caso di meningite traumatica.) P. Costantini.—p. 1143.

September 14, No. 74, pp. 1153-1168

38 Necessity for Excluding Tuberculosis Suspects from the Active Army. (Gravi problemi nel giudizio di abilita al servizio militare.) E. Villa.—p. 1167.

September 17, No. 75, pp. 1169-1184

39 *Prophylaxis of Abdominal Ptosis. (La profilassi delle enteroptosi occulte.) S. Salaghi.—p. 1172.

37. **Local Medication in Traumatic Meningitis.**—A young man developed severe meningitis four days after a bicyle accident with probable fracture of the base of the skull. Lumbar puncture showed the cerebrospinal fluid under high pressure and turbid. After withdrawal of 100 c.c., 5 c.c. of an isotonic solution of a colloidal silver preparation was injected into the spinal canal. Improvement was evident at once and a complete cure followed in less than three weeks from the first signs of trouble. He repeated this local medication daily for five, for three and for two days with intermissions of three days. The course was concluded with four daily injections of 3 c.c. of a 3 per cent. solution of phenol instead of the silver salt. He did not hesitate to withdraw from 80 to 100 c.c. of the fluid. The head was lowered below the rest of the body as soon as the drug was injected. The cerebrospinal fluid showed signs of acute inflammation but bacteriologic tests were constantly negative. In Costantini's eighteen other cases of meningitis, meningococci were always found.

39. **Prophylaxis of Enteroptosis.**—Salaghi remarks that he has found downward displacement of viscera in many patients presenting no outward signs of this tendency to abdominal ptosis. The abdomen does not noticeably protrude and does not sag but it is large and prominent and in a certain number of cases there is digestive disturbance. These digestive disturbances increase and become more common as the ptosis increases, and a vicious circle is soon set up, leading to pronounced enteroptosis in time with its train of symptoms. The disturbances are generally ascribed to indigestion but they are mitigated by reclining. Supporting the abdomen also gives relief. This is tested with one hand raising the abdomen, the other hand on the back. As loss of fat is an important factor in the etiology of enteroptosis it is important to combat this, and while waiting for the abdominal walls to regain their adipose tissue and the walls of the viscera and the sustaining ligaments to regain their tonicity, it is important to restore the viscera to place and hold them there by some supporting band device. He warns physicians that they may be indirectly responsible for the development of enteroptosis in the predisposed, by needlessly reducing the diet in case of slight and transient digestive disturbance. "It seems incredible," Salaghi remarks in conclusion, "that physicians can be incriminated in the development of a congenital anomaly, but this too often is the case. The anomaly is compensated for naturally, but the unstable balance is easily upset, and the physician's orders—possibly too strictly followed—may bring the upset."

Policlinico, Rome

September 17, XXIII, No. 38, pp. 1119-1142

40 Typhoid and Paratyphoid in the Vaccinated. (Osservazioni intorno alla vaccinazione antitifica.) F. Ravenna and A. Azzolini.—p. 1119.

41 Treatment of the Wounded at Rome Hospital. (I feriti curati nell' ospedale di riserva al Policlinico nel reparto del prof. R. Alessandri, dall' agosto 1915 all'aprile 1916.) V. Grossi.—p. 1126. Commenced in No. 36, p. 1076.

42 The War Has Saved France from Ravages of Alcoholism. (La guerra ha salvato la Francia dalle stragi dell'alcoolismo.) L. Luzzatti.—p. 1133.

Brazil-Medico, Rio de Janeiro

September 2, XXX, No. 36, pp. 281-288

43 *The Prognosis of Tabes. O. Clark.—p. 281. Commenced in No. 35, p. 273.

44 *Sodium Iodid from the Pharmacal Standpoint. (Pharmacia chimica do iodeto de sodio.) A. A. da Matta.—p. 282.

43. **The Prognosis in Tabes.**—Clark remarks that the more clinical experience one has, the more at a loss one feels when called on to state the outlook in a case of tabes. In a comparatively brief period he had some cases in which the course was most surprising; some with exceedingly severe symptoms rapidly progressed to a clinical cure, while certain very mild cases developed almost a fulminating course under the usual treatment. In three recent cases, without a trace of ataxia, each of the patients presented the Argyll Robertson and Westphal signs but one had cerebral, another bladder disturbances, and the third complete amaurosis in six months. Another patient with the complete manifold syndrome of tabes in the stage of ataxia was carried to his bed in the hospital in 1914 but improved remarkably under two doses of neosalvarsan, 0.3 gm. at a month's interval and eleven doses of 50 c.c. of a 10 per cent. solution of sodium iodid, all in two months, with two additional doses a month later. The man recovered his full earning capacity and has maintained it to date, and the Argyll Robertson sign and lightning pains have long disappeared. At the same time another patient, with mild oligosymptomatic tabes, in the pre-ataxia stage, was given a month's course of intravenous injections of mercury cyanid on alternate days. The condition grew rapidly worse and the man had to be carried when he left the hospital when treatment was suspended. Clark calls attention to the occasional aggravation of the visceral pains after an injection of neosalvarsan preceded by a purge. In some cases vision was materially impaired for a few days after a dose of neosalvarsan, but this soon righted itself. Some patients found that vision was improved after it. He regards the drug treatment of tabes as particularly promising for those who watch over their symptoms very closely. The tonic effect raises their spirits and the general condition improves even though the tabes proper is not modified.

44. **Sodium Iodid.**—Da Matta discusses this drug at first from the pharmacist's point of view, means to detect adulteration, etc. He advocates its administration to generate nascent iodin in chronic ear and throat disease, and by intravenous injection to stimulate vital functioning and repair. For local treatment he uses equal amounts of a concentrated solution of sodium iodid and a solution of hydrogen dioxid of twelve volumes. For the ear, he instils 5 drops of the $\frac{3}{10}$ sodium iodid solution and follows at once with 5 drops of the other solution. For the nose and throat, the two fluids are applied alternately in the form of spray or the patient gargles first with one and then at once with the other, alternately. He has found this local treatment effectual both in prophylaxis and treatment. For intravenous injection he uses a 10 per cent. solution, gradually increasing the dosage from 1 gm. upward. The usual limit is 20 gm. His clinical experience with it has been very favorable, especially for tuberculous glands and tropical buboes, in heart disease, tendency to angina pectoris, and arteriosclerosis in general, as the drug dilates the blood vessels and thus reduces the arterial tension. He adds that it facilitates secretion in the bronchi, and is useful as an adjuvant in "scrofula," in rebellious internal syphilis, gout and asthma and in rheumatism of all kinds. Associated with the salicylates he has found it particularly valuable in acute rheumatism.

Siglo Medico, Madrid

August 26, LXIII, No. 3272, pp. 545-560

45 *Seven Families with Peptic Ulcer in Two or More Members. (Ulcera peptica familiar.) L. Urrutia.—p. 546.

46 Ethical and Vicious Medical Periodicals. (La buena y la mala prensa.) C. Juarros.—p. 551.

September 2, No. 3273, pp. 561-576

46 Common Scalp Diseases Causing Loss of Hair. (Seborrea de la cabeza.—Alopecia pitiriasica.) E. de Oyarzabal.—p. 562.

45. **Familial Peptic Ulcer.**—Urrutia cites some instances on record in which two or three members of a family had

developed gastric or duodenal ulcer. He has encountered seven families with a history of this kind, operative treatment being required for gastric or duodenal ulcer in two or three of the adult brothers or sisters. Habits of life and diet cannot be incriminated for the peptic ulcers, as some of the families were widely scattered. One man lived in Cuba and his sister in Spain. In one family, one brother lived in the Philippines, a sister in Spain and a cousin in another country. All began to suffer from the stomach as they reached the age of 18. In another family the influence of alcohol might have been a factor in the two brothers but not in the sister. The "status lymphaticus," "asthenia universalis" as predisposing to peptic ulcer and a general tendency to hypoplasia are all manifestations of physical inferiority, and all have the common feature of predominant mononucleosis. The different members in the families cited sometimes presented different types of this substandard constitution.

Grèce Médicale, Athens

May 1-15, XVIII, No. 9-10, pp. 17-20

47 *Prophylaxis of Tuberculosis. (Moyens de prophylaxie contre la tuberculose.) E. Zemboulis.—p. 17.

47. **Prophylaxis of Tuberculosis.**—Zemboulis' article forms the contents of a little pamphlet designed for free distribution by the public health authorities at Constantinople. The prefect of Constantinople has recently had walls placarded with instructions how to combat flies and various measures for individual prophylaxis of tuberculosis. They are in simple language and in the speech of the people. Zemboulis' pamphlet is officially addressed to the public of Constantinople by the National Medical Association of the Turkish Empire.

Russkiy Vrach, Petrograd

XV, No. 32, pp. 745-768

48 Surgical Treatment of War Wounds of Peripheral Nerves. (Khirurgicheskoe liechenie ognestrielnikh ranenii periphericheskikh nervui.) A. M. Grinstein and E. S. Gurvich.—p. 750.

49 Indications for Suturing Nerves. (O pokazanikh k sshivaniu nervui.) A. G. Naumann.—p. 758.

50 Alleged New Species of Prowazekia. (Prowazekia Ninui Kol-, Yakimovoe.) V. L. Yakimoff.—p. 760.

Nederlandsch Tijdschrift voor Geneeskunde, Amsterdam

September 16, II, No. 12, pp. 989-1084

51 Degenerative Psychoses. (Bijdrage tot de kennis der degeneratie-psychose.) W. F. Theunissen.—p. 989.

52 *Operative Treatment of High Myopia. L. H. van Romunde.—p. 1011.

53 The Electrovibrator as Guide in Extraction of Metal Foreign Bodies. (De electro-vibrator als onmisbare gids bij de verwijdering van projectielstukken.) N. Voorhoeve.—p. 1018.

54 *Poisoning of the Hands from Wild Parsnip. (Een reeks gevallen van dermatitis veroorzaakt door de pastinaak—Pastinacea sativa.) K. Edel—p. 1024.

52. **Operative Treatment of High Myopia.**—Van Romunde reports his experience with eighteen operative cases of myopia. He operated a total of 137 times in all on these patients, thus averaging seven or eight operations on the eye. The full details of each case are tabulated for comparison. The list includes two cases in which detachment of the retina occurred but not in connection with the operative measures as there was an interval of two and five years between. The cases show that while an operation for myopia is always a serious intervention, yet vision was improved materially thereby. Even if progressive myopia is only arrested, this in itself is a great gain. The difference in refraction before and after the intervention in his cases amounted to about 20 or 21 D. The Fukala technic was applied in all. The eighteen patients were between 10 and 23. One young man had discission of the lens done fourteen times, with paracentesis of the cornea once, all with no complications. Choroiditis was found in one case on reexamination two years later. In another patient severe secondary glaucoma developed after the third discission, compelling linear extraction under general anesthesia, with sclerotomy. As to the operation increasing the chance for detachment of the retina, he thinks that the Fukala technic exposes less to this than the Hess-Sattler. About 4.1 per cent. of persons with myopia above 10 D. between the ages of 10 and 30 develop detachment of the retina without operative intervention. This percentage is much higher for persons with myopia of 20 D. which brings the proportion of nonoperative cases in which detachment of the retina occurs to about the same figure as in the operative cases, and, naturally, operative treatment is restricted to the severer forms of myopia.

54. **Dermatitis from Wild Parsnip.**—The men had been cutting weeds in a field and the next day their hands were red and inflamed, with blisters. The juice of the wild parsnip was found responsible for the dermatitis. It subsided in a few days but some of the blisters became infected in some of the men, prolonging the trouble. Edel induced the same dermatitis on a small scale on his own hand with some of the plant juice.

Hospitalstidende, Copenhagen

September 13, LIX, No. 37, pp. 892-912

55 Radium Treatment of Lupus Vulgaris. P. Haslund.—p. 893.

Ugeskrift for Læger, Copenhagen

September 7, LXXVIII, No. 36, pp. 1527-1570

56 *Treatment of Chorea with Magnesium Sulphate. K. Schroeder. —p. 1527.

57 *Neuritis from Incorrect Technic for Injection of Salvarsan. (Bemærkning til den intramuskulære Salvarsaninjektions Teknik.) A. Kissmeyer.—p. 1544.

56. **Magnesium Sulphate in Treatment of Chorea.**—Schroeder gives the details of nine cases of chorea minor in children and two cases in adults, rebellious to all other measures tried but yielding to subcutaneous injections of a 20 per cent. solution (by volume) of magnesium sulphate ($MgSO_4$) in small, slowly increased doses, from 0.2 gm. to 3 gm. a day or, in the very severe cases, up to 8 gm. a day. The results were so good that he thinks hospitals might be justified in giving this method of treatment a trial, keeping the patients under surveillance. The improvement under the dosage given and the return of symptoms when the drug was tentatively suspended confirmed its therapeutic possibilities. When Schroeder began this treatment he had no knowledge of others having applied it, but he later found records of its having been used by Calcaterra, Marinesco, Caronia and Grober, but all injected the drug by the intravenous or intraspinal technic. The subcutaneous route does not seem to have been used. In Schroeder's cases the chorea was of two or three months' standing in most of the patients. The range was from two weeks to three years.

57. **Technic for Intramuscular Injection of Drugs.**—Kissmeyer has encountered some cases of neuritis of the sciatic nerve developing consecutive to intramuscular injection of salvarsan, and he here discusses ways and means to avoid such a complication. He says that the accessible textbooks do not specify the technic in all its details. He advises to have the patient stand, bending forward a little, supporting himself against a table or the back of a chair, bending slightly toward the side where the injection is to be made, to relax the muscles. On the reclining patient it is difficult to find the right place, as the anatomic conditions are somewhat altered. The physician sits on a high stool, back of the patient, and marks the crest of the ilium and a line two fingerbreadths below the highest point of the crest. Another line is marked two fingerbreadths behind the trochanter. Where these lines intersect is the best point to insert the needle to avoid nerves and vessels. The cannula is pushed in very slowly, supporting the hands by the ulnar margin against the patient. The tip of the cannula should point toward the middle and downward. When the cannula is in place, the patient is asked whether he feels any pain, especially pain radiating into the legs. If he does, the tip of the cannula is drawn partly out and turned to point it a little more toward the side. If the tip hits against bone, it should be withdrawn a trifle. After waiting a little to be sure that no blood drips from the cannula, the injection of the drug proceeds. The injection itself does not cause much pain if amounts not too large are used. His usual dose is 0.4 or 0.5 gm. salvarsan in 3.5 c.c. oil. The pain that follows may be soothed with a little sedative and seldom is felt longer than for one day.